SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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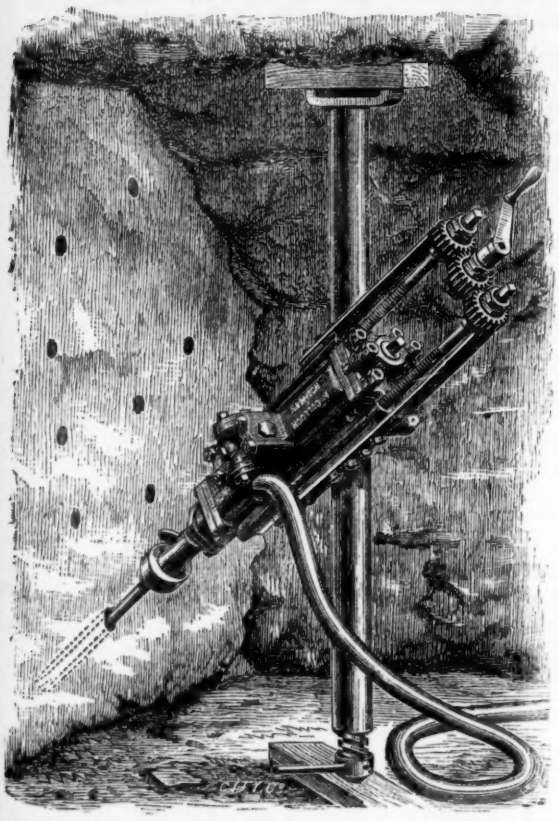
No. 2517.—VOL. LIII. LONDON, SATURDAY, NOVEMBER 17, 1883. PRICE (WITH THE JOURNAL) SIXPENCE BY POST £1 4s. PER ANNUM,

FIRST SILVER MEDAL, ROYAL CORNWALL POLYTECHNIC —Highest Award for Effectiveness in Boring, and Economy in the Consumption of Air

JUBILEE EXHIBITION, 1882.

THE PATENT

"CORNISH" ROCK DRILL.



This Drill has been constructed after a long practical experience in the requirements necessary for Mines, and has more than realised the expectations of its inventors. The chief objects in view were GREATER DURABILITY AND LESS LIABILITY TO DISARRANGEMENT; but it has also proved itself more EFFECTIVE AND ECONOMICAL.

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AIR COMPRESSOR,

AND

Submarine Deep Boring Machinery.

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STONE CRUSHERS.

ALL STRAINS TAKEN BY WROUGHT IRON OR STEEL.
DOES TWICE THE WORK OF OLD FORM.
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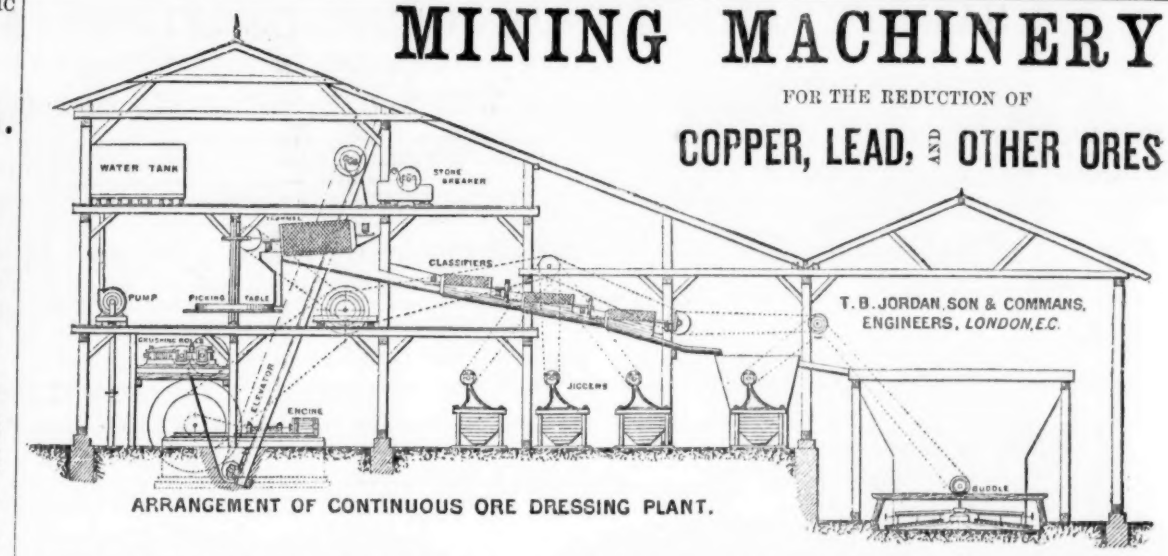

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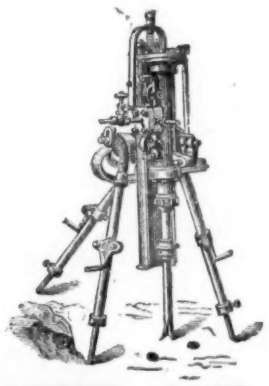
Philadelphia Exhibition, 1876.
Royal Cornwall Polytechnic, 1877.
Mining Institute of Cornwall, 1877.
Paris Exhibition, 1878.



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AND

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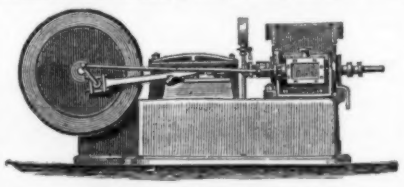
First Silver Medal awarded at Boring Competition, East Pool Mine, Sept. 1883.

PRIZE MEDAL, HIGHEST AWARD.



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The DRILLS are exceedingly STRONG, LIGHT, SIMPLE, and adapted for ends, stopes, quarries, and the sinking of shafts. They can be worked by any miner.

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SYDNEY. 1879.

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FIRST AWARD.
MELBOURNE, 1881.

SILVER MEDAL OF THE MINING INSTITUTE OF CORNWALL, TRURO, 1880,
for an Improved Method of Simultaneous Blasting.

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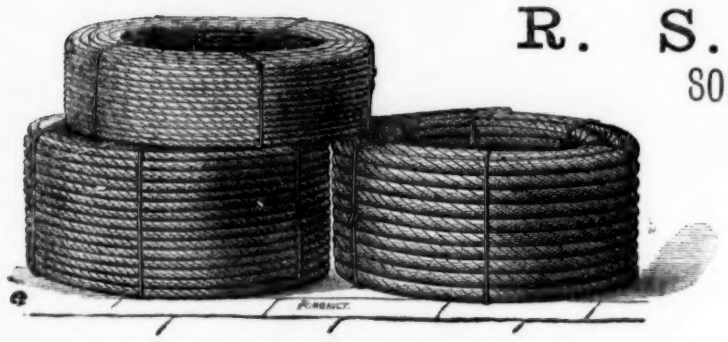

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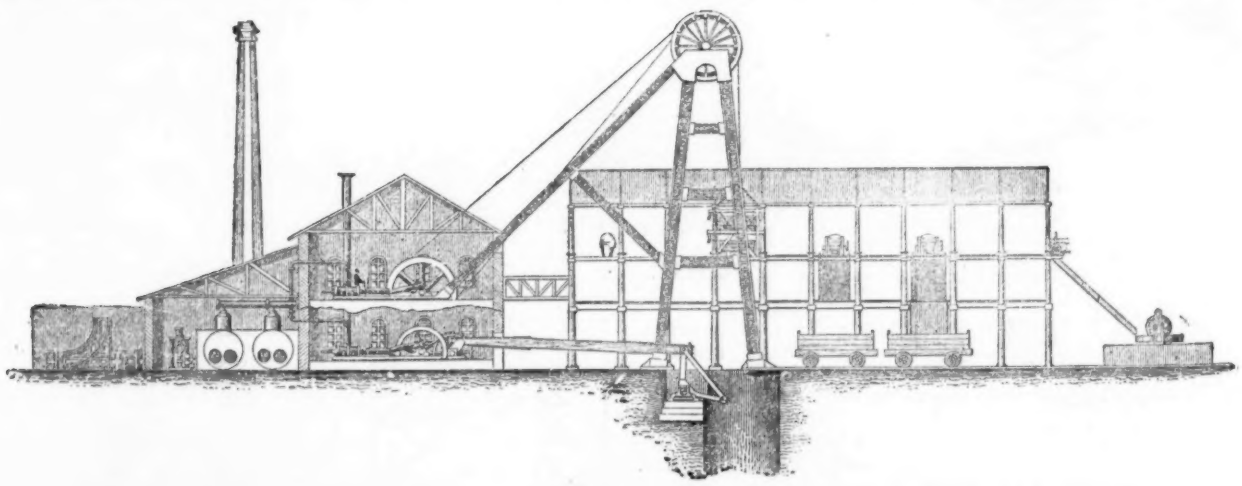

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UPWARDS of 25,000 of these Trucks and Wagons have been supplied to the South African Diamond Mines; American, Spanish, Indian, and Welsh Gold, Silver, Copper, and Lead Mines; Indian and Brazilian Railways, and to Railway Contractors, Chemical Works, Brick Works, and Coal and Mineral Shippers, &c., &c., and can be made to lift off the underwork, to let down into the hold of a vessel, and easily replaced. They are also largely used in the Coal and other Mines in this country, and are the LIGHTEST, STRONGEST, and most CAPACIOUS made, infinitely stronger and lighter than wooden ones, and are all fitted with R. H.'s Patent "Rim" round top of wagons, requiring no rivets, and giving immense strength and rigidity. End and body plates are also joined on R. H.'s patent method, dispensing with angle-irons or corner plates.

Patented in Europe, America, Australia, India, and British South Africa, 1875, 1877, 1878, 1881, and 1883.
N.B.—The American, Australian, Indian, and Spanish Patents on Sale.

CAN BE MADE TO ANY SIZE, AND TO ANY GAUGE OF RAILS.

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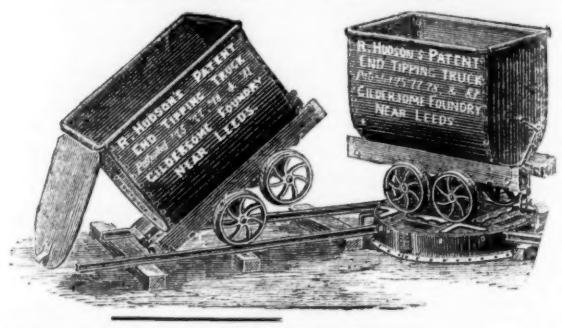
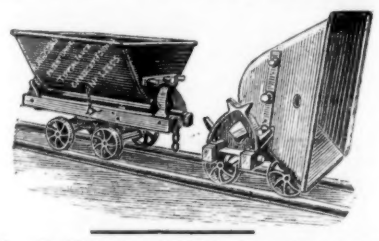
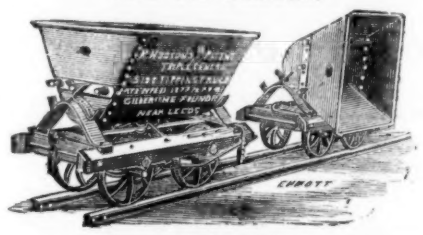


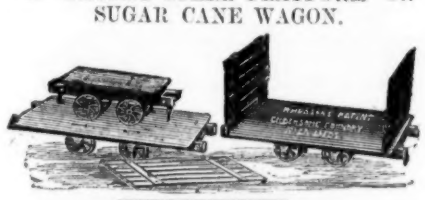
2. PATENT UNIVERSAL TRIPLE-CENTRE STEEL TIPPING TRUCK,
Will tip either SIDE or either END of rails.



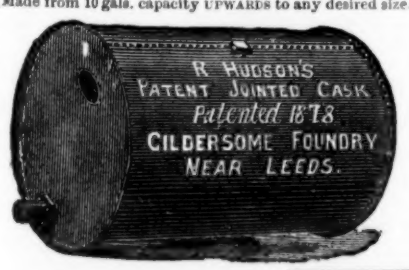
3.—PATENT TRIPLE-CENTRE STEEL SIDE TIP WAGONS.



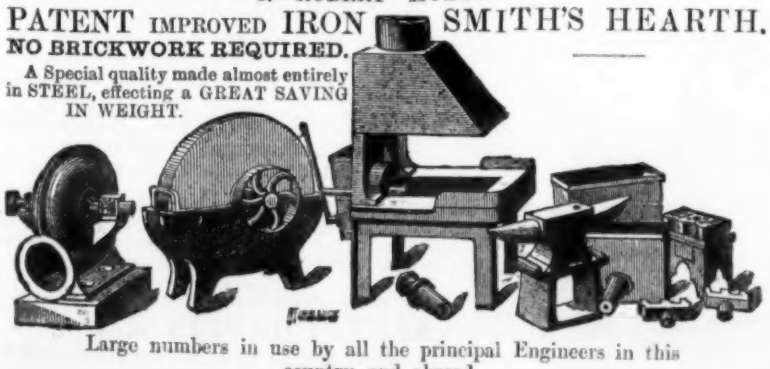
4.—PATENT STEEL PLATFORM OR SUGAR CANE WAGON.



5.—PATENT STEEL CASK.
(As supplied to H.M. War Office for the late war in Egypt).
DOUBLE the STRENGTH of ordinary Casks without any INCREASE in weight.
(Made from 10 gals. capacity UPWARDS to any desired size.)

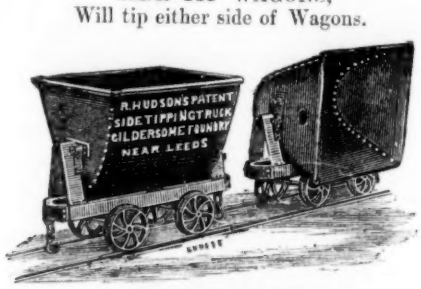


6.—ROBERT HUDSON'S
PATENT IMPROVED IRON SMITH'S HEARTH.
NO BRICKWORK REQUIRED.
A Special quality made almost entirely in STEEL, effecting a GREAT SAVING IN WEIGHT.

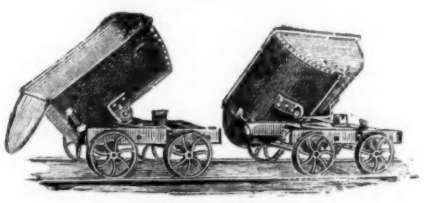


Large numbers in use by all the principal Engineers in this country and abroad.

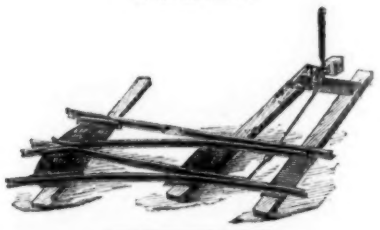
8.—PATENT DOUBLE-CENTRE STEEL SIDE TIP WAGONS,
Will tip either side of Wagons.



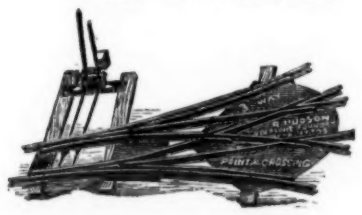
9.—PATENT STEEL ALL-ROUND TIP WAGON.



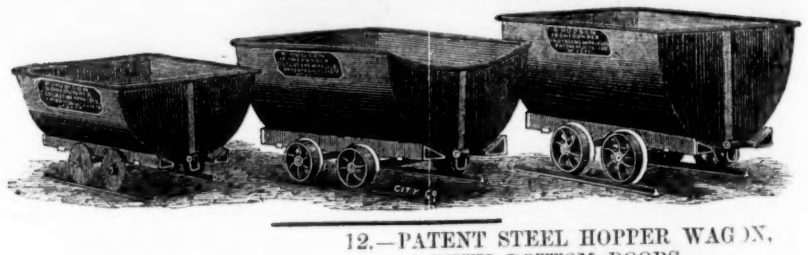
10.—LEFT-HAND STEEL POINT AND CROSSING.



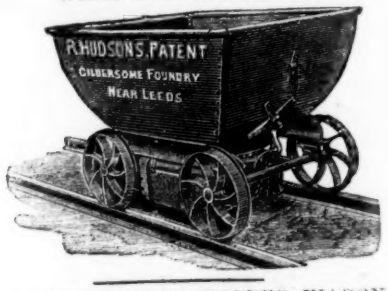
11.—RIGHT AND LEFT-HAND STEEL POINT AND CROSSING.



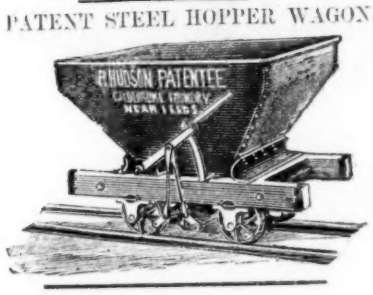
7.—PATENT STEEL MINING WAGONS.



12.—PATENT STEEL HOPPER WAGON, WITH BOTTOM DOORS.

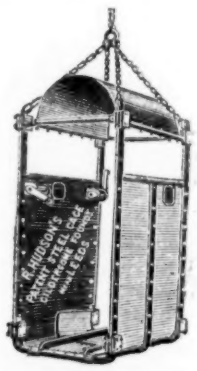


13. PATENT STEEL HOPPER WAGON.



14.—SELF-RIGHTING STEEL TIP BUCKET.
(The "CATCH" can also be made SELF ACTING if desired.)

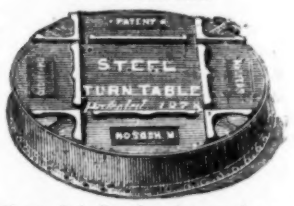
15.—STEEL CAGE.



16.—PATENT STEEL WHEELBARROWS.
Made to any Size.
Lightest and Strongest in the Market.

A great success.

17.—STEEL SELF-CONTAINED TURNTABLE.



(Also made in CAST Iron for use where weight is not a consideration.

18.—"AERIAL" STEEL WINDING TUB.

Largely employed in the South African Diamond Fields.

No. 19.—PATENT STEEL CHARGING BARROW.
DOUBLE the STRENGTH & much LIGHTER than ordinary BARROWS

ONE man can EASILY tip ANY WEIGHT in these wagons.

ALL KINDS OF BOLTS, NUTS, AND RIVETS MADE TO ORDER ON THE PREMISES.

BELL'S ASBESTOS.

BELL'S PATENT ASBESTOS BLOCK PACKING, for Marine and Pumping Engines. This packing has been specially designed to overcome the difficulties experienced by marine engineers and others in the practical working of engines of the most modern type of construction. The greatly increased skill and workmanship now obtained in the construction of engines and boilers have led to a rapid increase in the working pressure, the object being the attainment of a high rate of speed combined with economical working, the practical advantage of which, however, cannot be realised unless the Packings are so constructed as to avoid stoppages at sea for the purpose of re-packing the stuffing boxes.

It is now a recognised fact that the most perfect heat-resisting material suitable for the purpose of a Packing is Asbestos, but to ensure a successful application of this fibre, great skill is required in its selection and manufacture. In this Packing the Asbestos is woven into a stout cloth, and owing to the peculiar way in which it is manipulated, great elasticity is imparted to the Packing. So successfully has this been done, that with light screwing, it has been found in practice that little or no lubricant is required to ensure a minimum amount of friction, and to keep the rods from over-heating. An improved vacuum is always maintained by the use of this packing, which meets with unqualified approval wherever it is applied.

This packing is made in four forms to meet various requirements, viz., as Fig. 1, square; 2, round with solid rubber core; 3, with tubular rubber core; 4, without core, but with rubber inlaid.

As these packings are extensively imitated, and as it is a common practice among dealers and agents to supply the cheaper manufactures at my list prices, users are requested to see that the packing supplied to them bears my trade mark.

BELL'S PURE ASBESTOS PLAITED YARN PACKING. This is the best and most economical Piston Packing in the market for High and Low Pressure Stationary Engines. Of course there are many imitations of a Packing so universally approved of, but I am the Original and Sole Manufacturer of the genuine article.

Every 10 ft. length of this Packing bears a label with my Trade Mark, and users are recommended to see that this label is attached, to secure their obtaining the material they have ordered.

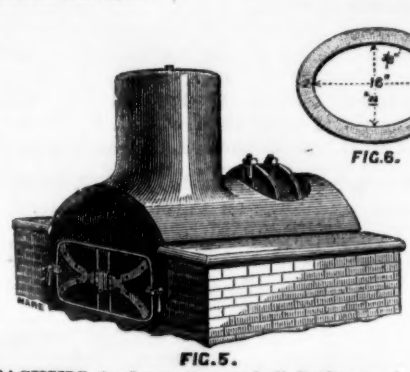


FIG.5.

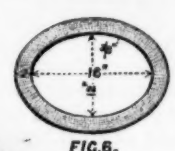


FIG.6.

FIG.1.

FIG.2.

FIG.4.

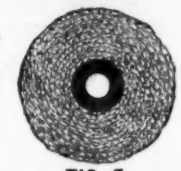


FIG.3.

BELL'S ASBESTOS YARN and SOAPSTONE PACKING for Locomotives, and all Stationary Engines running at a very high speed with intense friction.

The following Testimonial refers to this packing;—

Festiniog Railway, Locomotive Superintendent's Office, Portmadoc,
Mr. John Bell, 118, Southwark-street, S.E. January 13th, 1883.

DEAR SIR,—I have much pleasure in saying that the Asbestos Yarn and Soapstone Packing gives every satisfaction; indeed better than we expected. We have a locomotive packed with it, which has been running five months (and think of the piston speed with our small wheels). I think the Soapstone a great improvement, as it keeps the packing elastic, and prevents it getting hard. I am very pleased with its working, and also the very low price for such good lasting packing. The Asbestos Yarn we find is very useful, and answers admirably.

Yours truly, (Signed) W. WILLIAMS.

Every 10 ft. length of Bell's Asbestos Yarn and Soapstone Packing bears a special label with the Trade Mark, and engineers are earnestly requested to see that this label is attached, to prevent imposition by worthless imitations.

BELL'S ASBESTOS BOILER COVERING COMPOSITION (Fig. 5), for Coating the Pipes and Boilers of every kind of Marine and Stationary Engine. Non-combustible, and easily applied when steam is up; adheres to metals and preserves them from rust; prevents the unequal expansion and contraction of boilers exposed to weather; covers 50 per cent. more surface than any other coating, and is the most durable material of its class.

The composition is supplied dry, and is only to be mixed with water to the consistency required for use.

The following Testimonial refers to the Asbestos Boiler Covering Composition;—

The Maxim-Weston Electric Company (Limited), 29, Bankside, London, S.E.,
Mr. John Bell, 118, Southwark Street, S.E. Jan. 4th, 1883.

DEAR SIR,—In answer to your request, I beg to inform you that I find the thermometer placed 3 ft. above the boilers now stands at 93°; before your covering was put on it used to stand at 126°. With regard to the saving of fuel, I am unable to speak very accurately, as the boilers were not working long enough before being covered to ascertain the amount of fuel that would be consumed in an ordinary run; but I feel quite justified in saying that we burn less by about 5 cwts. per night than we were doing, and I shall be glad at any time to show the boilers to anyone who may wish to see them, as I consider yours the best covering that I have up to the present seen.

Yours faithfully,
(Signed) J. H. CUNDALL, Works Manager.

BELL'S ASBESTOS and INDIA-RUBBER WOVEN TAPE and SHEETING, for making every class of Steam and Water Joints. It is the most efficient material for making bilge water pipe joints. It can be bent by hand to the form required without puckering, and is especially useful in making joints of manhole and mudhole doors; also for large "still" joints where boiling fat and steam have to be resisted. It is kept in stock in rolls of 100 ft., from ⅛ in. (Fig. 6) to 3 in. wide, and any thickness from 1/16 in. upwards. Manhole covers can be lifted many times before the renewal of the jointing material is necessary.

The same material is made up into sheets about 40 in. square, and each sheet bears my Trade Mark, without which none is genuine.

The engineer of a world-renowned firm writes:—"There is not, nor can there be, any doubt as to the excellence of your Asbestos and Indiarubber Woven Sheeting—as a jointing material it is unrivalled."

The engineer of a large colliery writes:—"I would in all candour say that your Asbestos and Indiarubber Woven Sheeting is first-rate for joints. In my 25 years' experience I have not seen anything like it. I highly recommend it to all those who have to do with steam engines."

It is very necessary to guard against imitations of this useful material, and to secure themselves against being supplied with these cheaper articles at my price, users are recommended to see that every 10 ft. length of the Asbestos Tape purchased by them bears my Trade Mark.

BELL'S SPECIAL LONDON-MADE ASBESTOS MILLBOARD, for Dry Steam Joints, made of the best Asbestos fibre, is well-known for its toughness and purity, and is absolutely free from the injurious ingredients frequently used to attain an appearance of finish, regardless of the real utility of the material. Made in sheets measuring about 40 in. square, from 1-64th in. to 1 in., and ½ millimetre to 25 millimetres thick. Each sheet bears my Trade Mark.

To avoid spurious imitations, and to secure the receipt of genuine goods, all orders should be sent direct to the undermentioned addresses, and not through Agents or Factors.

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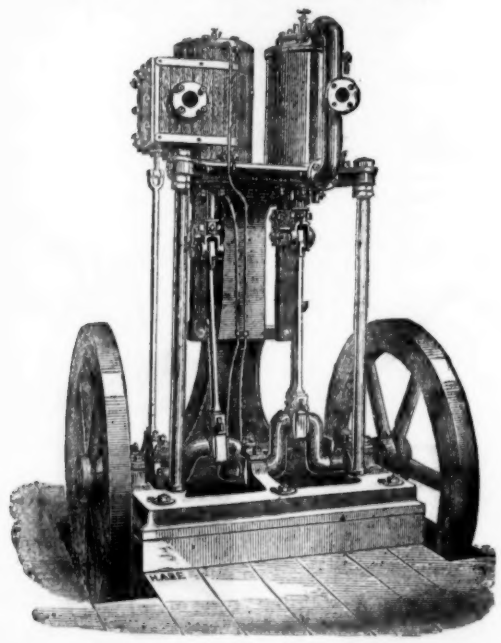

As an instance of the actual work done by this Machinery in various kinds of ground, some of it the hardest rock, it may be mentioned that in Cornwall, irrespective of the work performed by the "Champion" Rock-borers and Air-compressors purchased by various Mines, the drivage, rising, sinking, and stoping done by contract by the Proprietor with his own Machinery now amounts to over 1150 fathoms.

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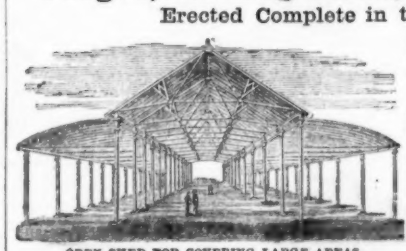
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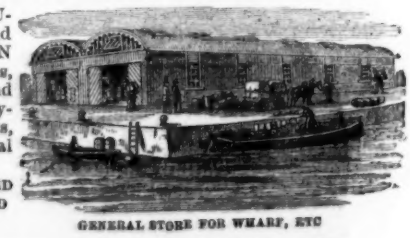
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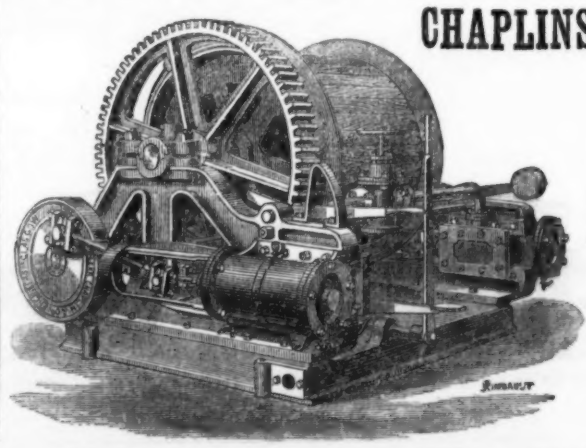

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Original Correspondence.

SEPARATING METALS BY ELECTRICITY.

SIR,—The attention of our client, Mr. Henry R. Cassel, of New York, having been called to the article in the *Mining Journal* of Oct. 27, on the new method of separating metals by electricity, we are requested to inform you that Mr. Cassel is the sole inventor and patentee of the process which you describe under letters patent granted to him on Sept. 26, 1882, and numbered 4580. We are also instructed that Mr. Atkins, whose name you mention as the inventor, was until a very recent date in the employ of our client in America, and so gained such knowledge of the subject as he may possess, but neither he nor the Electrolysis Company have any patent, and proceedings are now pending in regard to Mr. Atkins' attempts to make use of our client's invention.

We trust that in fairness to Mr. Cassel you will give this letter a place in your columns, as the statement in your article that another person is the inventor of the process is likely, if not publicly contradicted, to operate to the detriment of our client, who is now in this country making arrangements for the introduction of the invention.

Clement's-lane, Nov. 12. WATNEY, TILLEARD, and FREEMAN.

THE CALIFORNIA GOLD MINE.

SIR,—I have received the report of the above mine made up to May 31. I find a number of the shares are fully paid-up, and more than double only 12s. 6d. are paid up, and yet I find they all rank for the same dividend of 1s. per share April 30. This does not appear to me fair to shareholders, who, like myself, hold paid-up shares. I hope some explanation will be forthcoming at the ensuing meeting on this point, and also if the shares are all now fully paid-up, and, if not, what is the reason? and the amount of the arrears, as I would rather see more paid-up shares and less other liabilities. The report I find has not been favourably received, and there is some opposition to the present directorate. These matters the "bears" are not slow to take advantage of, as this week's prices will show.

Maidstone, Nov. 13. A SHAREHOLDER.

MINING PROSPECTS IN NEVADA.

SIR,—For practical and profitable mining there is all the field here enunciated in my several letters, and, as Lord John Russell is reported once to have said—"It is the duty of Englishmen to teach other nations how to live"—so I feel that it is the duty of Englishmen, or at least it devolves on them, to teach other nations how to mine; and as I know it can be done with decided advantage and profit to themselves I am the more intent in urging the changes I advocate on their attention. I risk nothing of reputation in the course I am advocating, as there is a margin wide enough to secure me outside of my published facts and statements. The State abounds in what are termed low grade ores—which means ore of from 5*l.* to 15*l.* per ton value in the rough state in the stone, and as they can now be reduced by the wet process at a cost not exceeding 1*l.* per ton, and thousands of tons of such ores are known to exist in various parts of the State, which can be extracted very cheaply—more akin to quarrying for some time to come than to mining in the ordinary acceptation of the term—a successful issue of well-organised and well-conducted enterprises may be esteemed a foregone conclusion. In this country managers and editors of newspapers and journals court all the information possible.

I am very glad indeed to learn that the prospects of a revival of mining activities is evident in your—or I might say the world's—metropolis, its radiating as well as converging centre. I hope the indicated revival referred to will be characterised by sobriety and good sense. English capitalists, if they only knew their strength, have a decided advantage over all others in that they have the funds, and in the exercise of ordinary business acumen and shrewdness may almost dictate terms to promoters of investments seeking patrons.

Ione, Nye County, Nevada, Oct. 15. ROBT. KNAPP.

NEW CALLAO COMPANY.

SIR,—The report recently sent to the shareholders is, to say the very least, highly favourable; indeed, it is a report of great value, and records the enhanced staunchness of the property, certainly more than was anticipated by the most sanguine shareholder, and if we have but a little more patience our reward is morally certain. The serious delay is sad indeed, and which any amount of compensation will not atone for. Still, as the report says, "it has enabled the working staff at the mines to complete the tramway, bridges, perfect the roadway, and prepare all necessary timber for the erection of the machinery on its arrival," so that actually the loss of time has been little.

The mail service organised is certainly a step in the right direction if it is properly carried out, and it is to be earnestly hoped that the directorate will thereby give us all the news in their power at regular periods. The more information given the more total interest will be taken in the concern; as a consequence the shareholders will be enabled more possibly to give assistance if wanted. Certainly they would not go up to the annual meeting like a flock of sheep, ignorant of details, and capable of being misled through sheer want of knowledge of how things really are. I have had too sad experience of the "close system" by directorates in other companies.—*Leith, Nov.* 14. W. B.

COLORADO MINES—LEADVILLE, ITS PRESENT CONDITION AND FUTURE PROSPECTS.

SIR,—In response to several enquiries concerning the present condition and future prospects of the Leadville Mines one of the papers of that camp makes the following general statement, based upon the actual business already done, and the development of the ore bodies made up to the present time.

So far as the operation and production of the mines are concerned the shortest and most pointed answer that could be given would be to direct the interrogator to the ore yards of the various smelters in Leadville, Pueblo, and Denver, which now have on hand from 80,000 to 100,000 tons of Leadville ore, the constant stream of ore teams coming from every hill and gulch, and the trains of ore and bullion that leave daily over the South Park and Rio Grande Railways. The daily production of the Leadville district, as near as can be calculated, exceeds 13,000 tons, possessing a commercial value of nearly $35 per ton, making a total production per diem $45,000, or a total for the year of nearly $17,000,000. The number of mines contributing to the production is about 75. The largest production made by any single mining company is the Iron Silver group, which during the month of September extracted and shipped 10,300 tons of ore. Following this property is the Silver Cord combination with a production of 3500 to 4000 tons a month. The Evening and Morning Star Mines on Carbonate Hill, and the Matchless and Robert E. Lee Mines on Fryer Hill, stand next with productions of 1500 tons to 2500 tons a month. The remaining properties that go to make up Leadville's production of 38,000 to 40,000 tons a month, produce from 1 to 25 tons a day. The magnitude which has been attained by the smelting industry of this section is illustrated in the Arkansas Valley Smelter, which this month is expected to reduce 6500 tons of ore. There are now six smelting-works in this city, and two stamp mills.

The total production of Leadville in the various metals, up to the present time, is about as follows:—Tons of lead, 179,000; ounces of silver, 35,250,000; ounces of gold, 50,000; tons of ore shipped to smelters outside of Leadville for treatment, 290,000. The total value of the product of the district up to the present time exceeds $80,000,000. The profits derived from working the Leadville mines are extraordinary compared with most districts, as attested by the numerous dividends paid by the incorporated mining companies, as well as the large incomes of individuals. Among the companies that paid dividends in the last 30 days are the following:—Iron Silver, $100,000; Silver Cord, $45,000; Morning Star, $25,000; Evening Star, $25,000; Leadville Consolidated, $20,000; Dunkin, $10,000; Amie, $10,000; Little Chief, $10,000.

The present resources and the future prospects of the mines of Leadville are equal to any time in the past history of the camp. The ore resources in sight in the various mines ready for extraction is very large, and cannot be exhausted for a long time to come. The continued exploration work in progress in all portions of the district is daily disclosing new orebodies, and we believe it is safe to say that within the past six months the extent of the resources developed is 50 per cent. greater than the extraction. Under such favourable auspices it is evident that the carbonate camp cannot but maintain an increasing production each successive year for an indefinite period to come.—*Denver, Colorado, Nov.* 2. J. FITZ BRIND.

THE AKANKOO MINING COMPANY, AND ITS MANAGEMENT.

SIR,—My attention has been called to a letter in the *Mining Journal* of Sept. 15, from Mr. J. B. Ross. * * * His report of May 8, to which he refers is, in the main, not merely a tissue of misstatements as to facts, * * * The work to which he partly referred therein was done, during my absence from the coast, by Mr. Richards and Mr. Mitchell, the former having been four years in the Belcher, on the Comstock, and the latter in the St. John del Rey. Their work—adit level, tramroad, and wharf—was most ably done. They have seen the board since their return, and proved to the directors the untruth of the statements made by Mr. Ross regarding their work.

Mr. Smith, the manager of the Cankim Bamoo Mine, and a practical miner with large experience in Australia and New Zealand, visited Akankoo a few days ago. He said that he had never, in the course of his experience, seen better work or a mine better opened up than Akankoo. He saw clearly that the mill site, which is now levelled and prepared, was selected with a view to a good fall for tailings and an ample water supply. The value of the rock now being trammed to the mill site, from the main reef cut by our No. 1 adit, was abundantly proved to Mr. Smith. * * * Mr. Ross says:—"I assisted Mr. Lane and selected his mining tools." The fact is, that his so-called assistance was really worthless, and the few things we have had reason to complain of were those I allowed him (from press of work) to select. * * *

Referring to the expenditure he speaks of, if we except the cost of prospecting expedition, of which this man formed one, and with which I had nothing to do, the total amount of coin, or cash, remitted to the coast during my management is considerably less than 5000*l.*

I am now sending home a large number of samples, showing visible gold, taken from our main reef, where cross-cut by No. 1 adit, and also from the same reef where cross-cut by No. 2 adit, 400 ft. west. This reef has been proved by the Taylor shaft sunk on the underlay from surface of outcrop to tunnel floor a depth of 110 ft. It is a clear and well-defined reef throughout, and of what is known as the "rake" species in America. Sections, both longitudinal and transverse, have also been sent showing the position of reef and back of ore, &c. The shareholders so far have every reason could they see our work to be satisfied. * * * A quartz mine is not opened up, and returns made "all of a heap," as can be readily learned by those unacquainted with mining. Our actual mining work only commenced with this year, and I am quite sure that within a far less period than has ever before elapsed with quartz mining, at least so far as English shareholders are concerned, our mill will be in operation, with, I trust and believe, continuous and happy results to the shareholders. E. LANE, Manager.

Axim, Oct. 18.

MEXICO AS A FIELD FOR MINING ENTERPRISE.

SIR,—This country, which has so long been under a cloud, and its vast mineral resources lying dormant owing to the past unsettled state of the Government, is now being looked after with eager eyes by the English and American mining men; and seeing that the Government is now firmly re-established, and railroads are being made all over the country, and that foreigners have equal rights and privileges with a native under the law, it is no wonder that the vast fields of unwrought mineral grants which abound with splendid lodes of silver, copper, lead, iron, coal, and tin should command the attention of capitalists of the present day.

I make bold to say that no country in the world is so rich in mineral as this country is, and all that is wanted to make it an El Dorado is a little foreign capital to develope its mineral wealth. It must be borne in mind that as a nation the Mexicans are not miners but farmers, hence their total indifference to the vast wealth which they tread over daily, and which can be plainly seen by the most unpractised eye. It is true mining is being carried on here, but nearly the whole of the mines working is due to foreign enterprise, and is a mere cypher compared to the vast fields lying neglected for want of a little capital.

The mines at present in operation in this (Pachuca) district have given immense dividends on a comparatively small outlay; to wit, Santa Gertrude's, on an outlay of $1796 has given about $1,300,000 to date, besides well stocking the mine in machinery, &c. Rosario and Guatamoczin Mines on a nominal outlay gave over $7,000,000 in about four years. San Buena and Maravillas Mines have already given over $20,000,000 in dividends, and yet grants in the immediate vicinity of these rich mines are idle for want of capital to explore them. The mineral bearing strata generally lies at a depth of from 20 to 100 fathoms, and this being a dry district it is seldom that pumping machinery is required until a depth of from 60 to 140 fathoms is reached.

The Government ask no dues till dividends are declared, they then take 1-25th part of the profits as dues. Leases are unknown, as the Government in granting concessions for mining purposes always grant for ever. I should say that all mining property belongs to the Government and not to individuals as is generally the case in England. F. W. B. (an English Miner.)

Pachuca, Mexico, Oct. 15.

SOUTH AUSTRALIA AS A FIELD OF ENTERPRISE.

SIR,—Hoping that by this time there is an improvement in England respecting mining affairs, I take the opportunity to state that a freehold property in the hills about 15 miles from Adelaide, and which contains a really good gold-bearing reef, has been offered for sale in England, and a report has obtained currency here to the effect that it has been conditionally sold for 30,000*l.* The land is rough and hilly, well timbered and watered, about 80 acres in extent, and, geologically speaking, is very promising for the production of the precious metal. Trial crushings of quartz from the reef have yielded from 2½ to 3½ ozs. of gold to the ton—a highly payable result. The reef is called the Eclipse reef. We in South Australia have not for the most part been very successful in our gold mining ventures, owing more to mis-management than to the scarcity of the metal. Shareholders are generally mere speculators who look for dividends in an unreasonably short time after mining operations have been commenced, and who are unwilling to expend money in fairly developing a mine. I mention this to explain the reason why it is necessary to look for foreign capital to work mineral properties here. I have at present in hand two gold mines which are considered likely to prove profitable enough if properly worked. But mining here is at such a low ebb that nothing can be done with them. One is the Lady Alice Mine, which has produced over 23,000*l.* worth of gold—though not properly worked, and consists of a Government lease of about 30 acres of auriferous land on the Barossa diggings, 13 miles from Gawler. The unworked portion of the land is said to be by far the richest.

The other mine is on freehold property about 40 acres in extent, and is newly opened. Some splendid and very rich samples of auriferous quartz have been got from the reef. It is in a good gold country near Blumberg and Mount Pleasant, about 32 miles east of Adelaide. I cannot say definitely what price the owner would take but for a 21 years' lease he asks 1500*l.* cash, and a royalty of 10 per cent. I fancy he would want 10,000*l.* for the freehold. The Lady Alice Mine, with all the machinery—which cost over 5000*l.*—and improvements could be bought for 10,000*l.*, and probably a commission of 10 per cent. allowed. There are so many opportunities for securing good mineral properties of various kinds that I think something ought to be done. There are several of our old copper mines that were but indifferently worked in the old days of the colony, and which I believe might be re-worked now with much better chances of success. Our railways now add greatly to the facilities of profitable mining. There are also silver-lead mines, plumbago, asbestos, talc, manganese, bismuth, and other metals and minerals deserving attention. The silver mines about 150 miles north-east from the Burra, are attracting a great deal of attention, and the ore—which contains a large percentage of lead, 70 to 75 per cent., also antimony—has yielded on assay from 150 to 3000 ozs. of silver to the ton. The South Australian Government is contemplating the construction of a railway to the locality—the Barrier Ranges at the north-westerly part of New South Wales. Some of these silver mines are in New South Wales just over the border, and some in South Australia.—*Adelaide, Sept.* 27. J. B. AUSTIN.

THE IBRUGGER IRON FURNACE.

SIR,—Permit me to direct the attention of the readers of the *Mining Journal* to a new furnace on the cupola model, for melting and at the same time refining iron or steel, which was invented by the late Mr. Gustav Ibrügger, ironfounder, at Norden. Its construction permits of the easy addition to the molten pig of wrought-iron scrap or steel, and of thus producing a metal which is uniformly hot, soft, and tough, like charcoal pig, and suitable for the finest castings as well as for the large cast parts of engines and machines. Besides a great saving in coke, there is the advantage that a low quality pig may be used to produce high-class castings. In order to establish these advantages it is necessary to give a detailed account of the construction and the working of this new cupola furnace.

The cupola furnace (Ibrügger's system) is substantially composed of a shaft or crucible, and a collecting trough or container, which latter is placed below the shaft. This collecting trough is separated from the shaft by an arched roof or vault, communicating with it through the apertures. On one side of this collecting trough there is the chamber or receptacle, which serves to hold and to provisionally heat the wrought-iron scrap; it is provided with an opening for taking off the gas. On one side of the shaft a large tube is fixed, and from this towards the top runs a smaller tube, which may be closed by a valve. Two tubes for leading the blast surround the furnace at a distance of a metre between the two. In order to equably distribute the blast in the shaft the latter is provided with two groups or series of vertical blast openings, having a narrow oblong form, and diminishing in height or tapering towards the outer surface of the walls, each group having 16 openings. From these tubes the blast in passing through the blast-pipes and openings reaches the interior of the shaft. Another pipe leads from the smaller blast tube to the collecting trough, where it introduces the oxygen necessary for consuming the gases generated. The furnace is, besides, placed sufficiently high up to ensure the compression of the gases. To the back of the shaft's bottom there is an opening for raking out the unburnt coke. In front of the collecting trough, whose bottom is slightly inclined, is the tap-hole. Moreover, in a closed chamber at the back of the well, and below the door, is a hole for running off the slag if necessary.

As regards the working of the cupola furnace it is fired like all other ordinary furnaces, and the disengaged gases not only are utilised in preparatorily heating the collecting trough, and in bringing to a white heat the wrought-iron in receptacle at the side of the collecting trough, but they can also be used for heating purposes; thus the greatest possible profit is drawn from the combustibles. The molten metal descends with the gas through the openings into the collecting trough. When the requisite quantity is collected the wrought-iron, which by this time has become soft, is pushed into the trough, and the blending is well stirred. Thereupon a new charge of wrought-iron is placed into the receptacle to be heated. In repeating this simple process at each pour, a thoroughly homogeneous metal is obtained. The longer the melting process lasts the more intense becomes the heat in the collecting trough, and owing to the influence of the perpetual white heat maintained on the molten metal under the protection of a scum of slag, a certain refinement takes place, which probably consists in a separation of the sulphur and the silicon. The gases which escape have the effect of carburising the wrought-iron scrap raised to a white heat, so that it becomes slowly converted into steel, a portion becoming fluid, and the other part (in a pasty state) combining with the molten pig-iron, and identifying itself with the same by the absorption of carbon.

When the wrought-iron is dissolved (as it were) in the molten pig, the carbon and silicon retained in it diminish, and a metal is obtained which is compact, tough, and at the same time sufficiently soft, containing about 2½ per cent. of carbon, and approaching a state of malleability when in red heat. For small castings 2 or 3 per cent. of wrought-iron scrap is added, for medium 10 per cent., and for large pieces of machinery up to 30 per cent. or more. The mixture of wrought-iron with the pig-iron does not exert any injurious influence on the latter, and owing to the high degree of heat present the metal remains perfectly fluid and suitable for casting. As the pig-iron runs into the collecting trough as soon as it is melted, the blast openings in the shaft may be placed at a much lower level than in ordinary furnaces, and it is this circumstance which causes the saving in fuel to such an extent that a cupola furnace of 35 cubic feet capacity only requires 5 cwts. of coke. Thus there is the advantage of a contracted zone of fusion, of a rapid passage of the molten metal, and consequently of a prompt melting of the iron. Under these conditions the pig-iron has not time to undergo whilst melting any chemical change, and owing to the slight degree of compression the graphite is less readily consumed. To obtain a good mixture it is advisable to make pretty large charges—say about 24 cwts. in a furnace capable of producing 4 tons hourly—and to wet the coke, so as to reduce the temperature in the upper part of the shaft, and to keep the zone of fusion as much as possible within its lowest limits. Owing to this practice steam is generated, which, passing through the incandescent coke, becomes transformed into carbonic oxide, carbonic acid, and hydrogen, the first and last of which gases contribute directly to the heating of the furnace. Only 5 or 6 per cent. of coke are required for the fusion, and thus the consumption of coke amounts in all to about 10 to 12 per cent.

As we have said before, the blast is not directed immediately on to the pig-iron, and thus the molten pig-iron is not in contact with the ardent coke, and consequently not liable to deteriorate by the absorption of sulphur. These two circumstances are the essential causes of the afore-mentioned favourable result. The slag collects in the well on the top of the molten metal, and may be taken off as required at the back of the furnace while the work is going on. The slag must be kept yellow, white, and basic rather than acid, since acid cinder readily takes up iron and becomes black. Thus in order to get suitable slag, and to prevent the silicon of the coke from too freely attacking the lining of the shaft, it is necessary to add a sufficient quantity of flux of some kind or other, and it is of great importance to employ a kind of coke containing much gas. In the construction of the vault or arched roof, and of the lower portion of the collecting trough, a good basic stone, burnt in a fierce fire, is found the best to employ. CHARLES DIRKS.

Leer, Hanover, Nov. 10.

RELIEVING MINES FROM WATER.

SIR,—We beg to hand you particulars of the new patented invention which we feel sure will be interesting to the readers of the *Mining Journal*. We allude to the new method of liberating mines and pits from water by freezing the same, as patented by Mr. H. POETSCK, M.E., of Aschersleben. This method for vanquishing the enemy of mining enterprise has on its first appearance in Germany created such a sensation that both in Europe and America the attention of all parties interested has been drawn to it. To describe the method briefly, it consists in converting the fluid mass into solid ice. This is done by circulating a very cold lye through the pipes, reducing temperature to a very low degree.

At the first trial, on a large scale of the above method, which took place at the Douglas Coal Mine, Archibald, near Stassfurt, pipes were carried through the swimming quicksand and fastened into the coal underneath to a depth of half a yard. The pipes were then closed at the bottom, ventilated and connected with the ice-making machine standing in the daylight in such a manner that the cold lye

issuing therefrom circulated through the freezing pipes. The first great trial was a complete success, and the water converted into solid ice could be worked upon as if it were sandstone.

Several authorities in the mining world did not hesitate to go to the above mine in order to be present at the trial, and certificates speaking in high terms of the invention have been received, and it is universally acknowledged that the new patented method is cheaper than any other known up to the present; but its principal merit consists in one's being able beforehand to calculate exactly the time and money required in order to free a mine. A. and E. COHEN.

Basinghall-street Nov. 12. ——

SLATE, AND SLATE QUARRYING—No. II.

SIR,—The epoch of the slate quarrying mania period was not of a very long duration, and can be fairly limited between the years 1860 and 1880. However, during this short interval innumerable attempts at slate quarrying had been made in nearly every glen, or on the side or summit of the various hills throughout the whole Principality of Wales. Wherever the least indication of slate could be found there a quarry would be started at once, and that without paying the least regard to the nature of the slate, whether it was mica, hornblende, or talcose, or whether it contained any perishable matter or not. Nor was there any proper attention paid to the condition of the slate beds as regarding their primitive condition. It is certainly evident to all who have paid the least attention to the geology of slate that the presence of too many intrusives or convulsions having acted severely upon it always has the effect to destroy the slate let it be ever so good; however, I shall subsequently refer to this matter again further on. It seems to have been a mystery to many, who are at a loss to know, what could have prompted so many to speculate in slate quarrying; and there is no doubt but what many instances of which, however varied they may be, will for ever remain latent from the eyes of the public, as their histories are very curious and mystical. But, moreover, it seems that the most apparent and vital causes of the great rush into slate quarrying speculation was the great demand for slates, and also the great profits derived from this industry. The enormous profits made were certainly very tempting to capitalists, as many of the quarries have been making from 20,000*l.* to 100,000*l.* annual profits. So, in consequence of these stimulations slate quarrying speculations became pregnant, and brought forth such an innumerable number of monstrous monsters that the world now dread even to look at anything of the kind.

As already alluded to, slate quarrying was attempted at places where there was not the least chance of success; and during the mania nearly all the hamlets in the glens and dales of North Wales echoed with the thrilling and thundering sound of blasting the rocks on the hill-sides, consequent on the strenous pursuit after this essential and invaluable mineral. Notwithstanding, however, such a vehement and extreme desire for slate the greater part of the maniac speculators of that time had to learn at great cost their slate quarrying experience, and, therefore, they ascertained from the consequences of their rash foolishness that all slate is not always good or profitable—thus verifying the old and familiar proverb that "Everything that gliters is not gold"—having received in remuneration for their errant enterprising efforts nothing but loss and disappointment. This, however, again has had the effect to lead to the very opposite direction. People now think that slate quarrying enterprises are amongst the most futile undertakings that can possibly be taken up, simply because they have failed to succeed in their vaporous and injudicious enterprises. No doubt but that a lesson will be taken from the immediate past, and that all future speculators will not merge or embark in any such undertakings again without the necessary precaution of ascertaining whether the properties they are about to invest in are really candid, and that they are in reality what they are represented to be; and if any reports have been made on such properties by persons calling themselves either practical or scientifical it would by all means be advisable that the veracity of such reports should first of all be well demonstrated prior to their full and general acceptance, as negligence in this respect has often led to very serious and grievous consequences. Should such caution be fairly exercised it would certainly serve as a fundamental basis to operate upon, and, at the same time, would tend to furnish the means to effectually frustrate the purloining and delusive efforts that are often made at slate quarrying in many a duskly region, where, as observed before, there is no chance whatever for success.

Respecting my own capacity I must admit that I belong to the former of the above classes; but, at the same time, I must also admit that I have the greatest respect for the latter, ever holding it in the highest esteem. The practical and scientifical elements or qualifications are beyond doubt most essential as safeguards to direct aright in slate quarrying; and the evidence of this is evidently conspicuous from the annals of the gloomy immediate past—the records having been recorded on the everlasting and innumerable hills of the Principality, which with the greatest propriety be termed "the records of the rocks." To prove and illustrate what we have already laid down, it will be necessary to have recourse to a few of these incidental, or, rather, anecdotal records. During the great slate quarrying mania one of the principal slate companies was apparently influenced and led by the spirit of the times, and a desire was thus infused in them, like that of Jabez of old, for the extension of the barrier of quarrying jurisdiction; consequently they migrated, no doubt through the influence of a good practical authority then in their service to a place known as the Pantmawr. This place is situate near the summit of the Moelwyn Mountain, and not far from the great Moelwyn Slate Quarry; the one situated on the east and the other on the west side of the mountain. However, this company began operations adequate for an extensive quarry at this place, in the vicinity of the mountain peak known as the great Moelwyn, or otherwise known in Welsh as the Moelwyn Mawr. Here it is very natural to suppose that the practical man would at once recognise the same beds of slate as those worked upon at the Welsh Slate; and he would, or rather did, in consequence thereof therefore infer that it only required to penetrate into the heart of the mountain here, as at the Welsh Slate, to ensure an infallible and emolumental quarry. But what was the result of their strenuous efforts to open a quarry on this lofty mountain? To effect this it can be most emphatically replied that the very record of the result has been most intelligibly inscribed both on the internal and external parts of the mountain. And, finally, the absolute abandonment of the place by this company coincides with all the symptoms and testimonies connected therewith that slate quarrying at this point has but a duskly prospect for remuneration. What has been said of this incident it will be trusted will suffice to show and prove the deficiency of the practical man. Now, it behoves us to ascertain the views of the scientifical, in order to compare them with the sciolous views of the practical. The scientific it is well known never dwells entirely on the external appearances; but, by the aid of such indications as may be presented to him, he is enabled to penetrate into and comprehend the great mysteries of Nature. Thus, the geologist by his untiring search into the formation of the earth's crust has come to the conclusion to place the Laurention as the bases of all known strata. Here he views the old eozoic rocks with a reluctant scrupulosity, the symptoms of life being hardly recognisable, and, therefore, most problematical. But, however, by soaring from strata to strata, by way of stepping from Laurentian to Cambrian, Cambrian to the Silurian, and from thence to the Devonian, &c., when he finally reaches at last the uppermost Tertiary series; and throughout the whole of this intricate serial career the geologist beholds the progress of animation from series to series; and so, from his keen observation of the general character and the different effects on the rocks resulting from various causes he is thus fairly enabled and qualified to judge of the competency of any locality for a slate quarry. Let us now, therefore, accompany the scientific geologist to the summit of the great Moelwyn to see if his views will corroborate those of the practical man. Here he will endeavour to find out the nature of the strata, in order to see whether they possess any traces whereby they may be identified by their equivalents elsewhere. So by a close and careful examination they are undoubtedly identified, as the equivalents of the principal veins of the adjoining district. So, thus far, both the practical and scientifical views coincide. Now we want to know his views on a very important point respecting the condition of the strata, whether it is on its primary posture or not, and whether any abundance of intrusives have forced their way into it? these points are of the utmost importance. So by a careful inspection the geologist again finds that the strata on the summit of this peak of the Moelwyn is wholly crumpled, bearing the evidence of having been most severely convulsed and contorted at some remote period, so this, coupled with the existence of large masses of intrusive greenstone a little to the north, but yet in its immediate vicinity, convinced him at once of the impossibility of the existence of any good slate in association with such unbecoming and prejudical association, and he may furtherly announce that no sciences or arts can ever be brought into play to enable anyone to encounter successfully the unsurmountable obstacles that these combined and formidable prejudices here present. Now, therefore, the reader can fairly prepare and judge for himself the coincidence of the practical and scientifical views. And thus it is seen that the scientifical is as essential as the practical to ensure anything like certainty. Moreover, before leaving this subject I may here intimate that should anyone wish to view an exhibition of crumbling slate-rock I know of nowhere where they can enjoy or see a grander display of such than on the summit of the great Moelwyn; the sight can be compared to nothing but to a bundle of straw in a whirlwind, and that twirled and twisted in every imaginary way, bearing the true characteristics of real contortions. The sight of the sort is most magnificent, and affords ample evidence in itself of the pernicious effects of internal convulsions.

The preceding incident is a case which should have called forward the existence of the scientifical, which if exercised upon would have been a preventative to error and disappointment. But now I shall note another, in which the scientifical required the co-operation of the practical. The case was similar to this. A certain place was being tried for a slate quarry, and when it was found that the rock or slate was unproductive that those who were connected with the concern managed to procure a quantity of good blocks from a slate quarry district some miles away, and so lowered them down into a shaft that was sunk where the operations were then being carried on, knowing that some parties likely to take an interest in the concern were to visit the quarry the next day. So when the parties came on the works they heard some loud cries of bravo! arising as it were from the bowels of the earth. They were, of course, anxious to know the meaning of such extraordinary excitement, and upon enquiry it was communicated to them, with much apparent gladness, that the men working in the shaft beneath had just blasted down some very superior blocks of slate, and that the bravo they had just heard was the giving vent to the feelings and rejoicings of those men. This being the case orders were immediately given to haul up some of those blocks to he surface at once. The orders were no sooner given than executed, and the blocks conveyed to a shed, where they were manufactured into slates, and very good slates it appears they were, possessing all the essential virtues and qualities of good slates in every respect. So, owing, to the clever performance of this piece of business the visitors decided at once to participate in the concern, and to provide sufficient capital for its further development, there being not the least doubt respecting the quality and excellence of the slate. And by what I can find out that from 60,000*l.* to 80,000*l.* has been expended on that concern through this mean device of diabolical delusion. The blocks had been conveyed thither by night, but had there been a thorough practical man among the visitors he could easily have found out that the blocks were not derived from the slate beds of that quarry, and, therefore, could have prevented innocent persons from being mislead. So this instance, as I have previously stated, serves to show that the assistance of a practical man of ability and integrity is really indispensable in such cases, or in any other matter relative to slate quarrying. This case also is a fair instance of the rashness on the part of the speculators of the mania slate quarrying period. People then plunged into speculation without the least hesitation or investigation, and so the natural consequence was that they were indiscriminately caught in the inevitable latent nets and snares of unhappy delusions of various devices. THOS. GILL JENKINS.

Blaenau, Festiniog, Nov. 9. ——

TRUSTEESHIP, AND THE GREAT BARRIER LAND, HARBOUR, AND MINING COMPANY.

SIR,—Nothing could be more gratifying than the announcement contained in the City Article of the *Mining Journal* of Nov. 3 that the official liquidator, Mr. Good, is about to render an account of stewardship, and that the shareholders are likely to have a handsome return of capital. The notice says that it appears that when the company went into liquidation in 1868 the assets consisted of 30,000 acres of valuable land, upon which were several prosperous farms in a favourable position, on Great Barrier Island, at the mouth of the Gulf of Auckland, New Zealand. The liquidators appointed in 1868 were Messrs. P. Wright, Frewer, and Parke Pittar, but after the liquidation had been going on for some two or three years an order was made that the winding-up should be continued under the supervision of the Court, and Mr. Good (of Messrs. Good, Daniels, and Co., Poultry) was appointed official liquidator. Since the appointment no public meeting is known to have been held, although it is stated that a considerable proportion of the assets has been realised, and that the remainder has vastly increased in value—these, however, are matters upon which nothing can be definitely stated until the liquidator's accounts are publicly submitted. It is understood, however, that there will be no further delay, Mr. Good having given a shareholder a distinct assurance that he will forthwith call a meeting to render a complete account of his stewardship. From the reputation of the firm it is not doubted that whatever sales of property have been made have been made at good prices, and that whatever remains in hand will be well sold; so that both shareholders and debenture-holders may, if they carefully watch their interest, look for a speedy return of a large proportion of their investments. The calling of the meeting will be anxiously waited for.

Truly the meeting will be anxiously waited for; but in the meantime let me congratulate Mr. Good upon the willingness he has shown to render accounts, and express the hope that the result will be as favourable as in another concern in the Southern Hemisphere with which I was connected. The Adelaide Land and Gold Company was one of the concerns formed under the French law in order to secure Limited Liability before we had the benefit of it in this country. It failed for the same reason as the Great Barrier Land, Harbour, and Mining Company failed—for want of capital and patience. The gérant of the Adelaide Land and Gold Company was the late Mr. Charles Hancock (of Hancock, Sharp, and Hales, solicitors), and he also was, I believe, appointed liquidator. He realised the assets even more quickly than Mr. Good—closing up everything in about five years instead of 12 years—and with results that satisfied all. He declared several dividends, and the shareholders received in the aggregate 2*l.* 5s. or a little more for each 2*l.* share originally taken. It is true that they only got this odd 5s. for the five years' interest on their 2*l.*; but considering it was a liquidation matter none of us grumbled. Now, as Mr. Good knows quite as much about business as the late Mr. Hancock did, what may we expect from the 30,000 acres of valuable land which were handed over to him as assets. There were only 10,000 shares of 5*l.* each, and I am quite sure that if Mr. Good will at once send out cheques for 5*l.* 12s. 6d. per share the shareholders will say nothing about losing the 12 years' interest, and would, I should think, be inclined to vote Mr. Good the balance as a testimonial. Only think of it. A testimonial to a liquidator. It would be almost as much of a phenomenon as the Scotchman's—that of a cow climbing up an apple tree backwards—and would place the recipient at the head of his profession.

I have just been reading that a memorandum has been issued by the Inspector-General in Bankruptcy saying—It appears that many trustees in liquidation under the Act of 1869 have been in the habit of refusing to submit their accounts to, or allow them to be inspected by the creditors. The Board of Trade being of opinion that creditors are entitled to all reasonable information is availing itself of the power conferred on it under Section 162 of the New Bankruptcy Act, and requiring from trustees who refuse such information with regard to their accounts to enquiring creditors a statement of their receipts and payments verified by affidavits, together with the vouchers for the same. The Board of Trade does not apparently consider it to be its duty to supersede the action of the creditors by investigating matters which the latter are authorised and required by the Act of 1869 to investigate for themselves, but only to assist them as far as possible in obtaining the information to which they are entitled. Now, I should like to ask some correspondent of the *Mining Journal* more experienced than myself whether this circular is directed against liquidators of public companies or whether it merely relates to trustees under the bankruptcy of private individuals. If it relates to public companies there are three or four concerns in which I am interested where the official liquidators do not display the willingness referred to in Mr. Good's case, and I should like to know whether something cannot be done to force the rendering of an account and closing of the liquidation where the liquidator fails to adopt Mr. Good's course and come forward without compulsion.

But to return to the Great Barrier Land, Harbour, and Mining Company, let me make one suggestion. When Mr. Good convenes his meeting, which I trust will be a public one, and that it will be fully reported in the Journal, the shareholders will be in the awkward position of having to combat the official liquidator's professional acumen without having the opportunity of previously analysing the report and accounts. I would, therefore, suggest that they secure legal assistance beforehand, and as I see from the London Directory that the firm of Hancock, Sharp, and Hales still exists at New Broad-street, it would, I think, be well if every shareholder were to put himself in communication with them in order that the whole affair may be thoroughly investigated, the dividends paid, and Mr. Good relieved of the heavy responsibility he has so long borne. The 30,000 acres ought surely to represent 150,000*l.*, so that after allowing liberal expenses for the liquidation our dividends ought to be large. But we must have a rallying point and must show that we recognise the fact that we have a right to the assets and intend to have them.—*City, Nov.* 12. —— PATIENCE.

SPEED OF ROCK BORING.

SIR,—The advance headings of the Arlberg Tunnel having already met, it is unquestionable that the boring has been prosecuted rapidly. We hope the facts, figures, and particulars of this bore may soon be given fully in the columns of the *Mining Journal*. We find on examining the official monthly reports of the St. Gothard Tunnel that the average sectional area of the south heading was 5 per cent. greater than the average section of the north heading; and that the average pressure for working the boring machines at the south side was 22 per cent. less than the average pressure at the north side. It is further officially shown that during one month only was the pressure as high as four atmospheres (60 lbs.) at the south heading, and during fifteen months only did the pressure at south side reach three atmospheres

Delahay-street, Nov. 15. —— MACKEAN AND CO.

COLLIERY EXPLOSIONS, AND SAFETY-LAMPS.

SIR,—The importance of doing all that is practicable to prevent accidents in mines induces me to offer a few remarks upon this subject at a time when the country is shocked by further accounts of terrible loss of life from explosions of fire-damp. The accident at Accrington has appeared very difficult to account for, occurring as it did in the Gannister coal, a seam little more than 24 in. in thickness, and one of the lowest in the series of workable seams in this country. Hitherto it had not been known to emit large and sudden quantities of fire-damp, such as the well-known and disastrous occurrences in some of the seams in South Yorkshire, Lancashire, and South Wales; but information obtained last night (Sunday) points out unmistakably that the accident has been due to a sudden emission of explosive gas. It is said, "The cause of the explosion is no longer a mystery. The explorers have come across a blower in one of the headings, which they are confident accounts for the calamity. They have not dared to approach it with lights, but several have examined it, including Mr. Dickinson, the Government Inspector. The blower is a very large one, and the probability is that the miners, in rushing away from it brought about their own destruction, for the Davy lamp when passed through coal gas quickly, as is well known to experienced miners, will cause an explosion."

Two very serious reflections may well arise out of the above statement. First, that it is highly dangerous to assume that because a seam of coal has been worked for many years and over very large areas without any indication of a dangerous character, like heavy and sudden discharges of fire-damp, such an occurrence is impossible or even improbable. Secondly, that the time has now arrived when the Davy lamp should be forbidden to be used. It was well known to its inventor more than 60 years ago that this lamp was unsafe in a highly explosive atmosphere if moved with great rapidity. In his work "On the Safety Lamp for Coal Miners, with some Researches on Flame," published in 1818, he points this out in several places in a very clear manner. For many years this weak point in his lamp did not possess the same elements of constant danger as it does now, inasmuch as the currents of air seldom passed then at so high a velocity as to render the lamp dangerous, unless it was moved very suddenly and rapidly (for instance, dropped) by the workmen. But now all is changed. The enormous areas of underground workings consequent upon the increasing depth of our coal mines require a corresponding increase in the rapidity and volume of the ventilating currents, thus rendering the use of the Davy lamp most dangerous when large and sudden issues of fire-damp ensue.

The introduction of a lamp which may be looked upon as practically safe in a highly explosive mixture, and moved at any possible rate by a workman in an emergency, is now one of the most important *desiderata* in the management of fiery mines, and ought never to be permitted to rest until it is satisfactorily solved. It is greatly to be hoped, as it may reasonably be expected, that the Commission now sitting on accidents in mines will be in a position to suggest some practical solution of the problem, and that it will be greatly aided in the discovery of a really safe lamp by means of the premium of 500*l.* which is offered, with a view to the prevention of accidents, by Mr. Ellis Lever, for the production of such an instrument, whose value is to be determined by passing the critical ordeal of eminent scientific and practical men. An efficient substitute for gunpowder in fiery mines is equally to be desired, so as to remove another source of frightful risk, and an experience of many years amply warrants me in the implicit belief that the only way to prevent a continual occurrence of these hideous blots on coal mining will be to have efficient ventilation, safe lamps, a substitute for gunpowder, and, if I may be forgiven for so saying, that the whole details of mining may be directed by managers who have acquired the best practical and scientific education that the country and the time can produce and impart. JOHN BROWN, M.I.C.E., F.G.S.,
Professor of Mining.

Mason Science College, Birmingham, Nov. 12.

THE PREVENTION OF COLLIERY ACCIDENTS.

SIR,—By appalling accounts of destruction of life in our collieries we are sadly reminded that the most dangerous and disastrous period of the year is at hand for the colliers; and, moreover, that under the present system of colliery operations this awful destruction of life must go on. The question must naturally arise in the minds of many—Can anything be done to prevent it? The cause of numerous accidents answers this question in the negative. The intelligent and valuable article on this serious subject in the *Mining Journal* of Nov. 3 strikes at the root of the terrible disasters, often heartrending to read of, and ought to be taken to heart by one and all connected with the coal mine industry. It gives three of the most vital points to be considered to remedy existing evils. Government under present circumstances, except in the cases of enforcing the prohibition of the use of naked lights and gunpowder, is powerless to diminish the number of accidents. How many cases can be enumerated where naked lights and gunpowder have caused serious loss of life, and yet in a few months after these sad visitations—as you so aptly put it—"but little is remembered by the outside world of the catastrophe and its terrible results."

The requirements in the direction of a "safe safety-lamp" is un

doubtedly the most important factor in the prevention of colliery accidents; and, as I have previously stated in the *Mining Journal*, if a premium was offered for one it would doubtless stimulate the mechanical genius of those who are cognisant of what is really required to produce one. Even greater severity than is at present used in cases of carelessness on the part of miners would have a salutary effect. In the face of our scientific skill and mechanical abilities, the immense loss of life in the mining industry is sad and grievous to contemplate. Nevertheless, it is a consummation devoutly to be wished for that the time is not far distant when accidents entailing loss of life in our collieries from explosions of gas may be numbered amongst the painful things of the past. W. NINESS.

Perranporth, Nov. 13.

LEVANT MINE, AND ITS MANAGEMENT.

SIR,—A second mine account having been held at Levant on Nov. 6, from which the usual press reporters were excluded, I beg to bring before the public generally, and the non-resident adventurers in this mine particularly, the real position which this important and rich mine now occupies, comparing it with the account preceding, and contrasting them with the past. In the first place, after a delay of two years the mine has at last become assured with respect to the Employers' Liability Act, paying an assurance corporation 5s. per cent. on the annual labour cost of those employed, which, estimated at 15,600*l.*, involves the yearly payment of 39*l.* For that sum the assurance company engages to conduct the defence of any prosecution entered against the mine authorities, and also to pay all expenses connected with such, but should a joint assurance be effected through the miners agreeing with the Levant adventurers to contract themselves out of the Act, then the assurance company stipulates to pay the injured miner or labourer one-third of his average earnings weekly for a period not exceeding 26 weeks, and in case of death ensuing an average year's earnings to his representatives. As 6d. every four weeks is still deducted for club money from each labourer amounting in the aggregate to nearly 100*l.* a year—the number of men employed in the mine amounts to 228, not counting 68 boys, which are generally charged as half men—there is evidently a decided intention displayed to defeat the object of the Employers' Liability Act, and to deprive the miner of a considerable proportion of what he is fairly entitled to.

In justice, however, to the executive of this mine the out adventurers meet no better treatment at their hands, for whereas the total expenditure of the mine at the previous account held in July last amounted to 6590*l.*, that at the past account amounted to 7193*l.*, a difference of full 600*l.* These extra charges on the mine were mainly due to the two items, coals and candles. As regards the former I find that the average yearly cost for the three first whole years the mine commenced working amounted to 1376*l.* annually, when the heavy charge was repeatedly brought against a prominent committee man, who supplied the mine with coals, that a large number of tons of picked coal was first extracted from every cargo, and that the smalls only were forwarded for the use of the mine, so that the waste from the fires was fourfold more than there ought to have been. Pressure being continued that gentleman resigned his position of committeeman, with the result that the yearly charges for coal during the six succeeding years, taking a nominal average, fell to 857*l.* and 876*l.* consecutively, so that the mine thus saved 500*l.* a year, or upwards of 3000*l.*; but since this mine has been without a managing agent our coal charges have advanced the last two years to an average of 1475*l.*, showing that there has been an increase of 600*l.* a year compared with the six previous ones. The charge of 640*l.* for coal at the last account seeming extraordinary mention was made of such, which was met with this reply from the committee manager, that the coal had been stolen, adding by way of palliation that it was impossible to prevent it. I would mention that the mine does not possess such a thing as a thief-detecter, in the shape of a weigh-bridge, and that it is a matter for conjecture whether all the coal charged the adventurers ever sees the mine.

Surely the whole of the committee are collectively responsible for these and other extortions, although one of them, a neighbouring purser, suggests that if merchants' bills were not better looked after he should recommend anyone with money to spare rather than invest in Cornish bals to give it to a Dorcas society. The credit side showed for the past account 7142*l.*, less lords' dues, 315*l.*—tin, 88 tons odd, and copper, 442 tons, realising 4460*l* and 2482*l.*; whereas the former account held in July showed a credit side of 7408*l.*, less lords' dues 312*l.*; also 89 tons of tin, of which 10 tons were credited unsold, the whole being estimated at 4730*l.*; the copper, 504 tons, realising 2678*l.* On the strength of the 10 tons of tin unsold, the whereabouts of which was problematical, the fictitious dividend of 5s. per 2385 share was declared, the design of which is self apparent. *Bona fide* dividends may justly be expected from this mine if integrity be combined with intelligence, and this the adventurers may consider in prospect through the addition to the committee of this mine of Messrs. Bolitho and Field, who were elected by the whole meeting. And I venture to assert that if a tithe of the energy and keenness of perception evinced by them in their respective callings of bankers and smelters be devoted to the affairs of Levant a radical change for the better will become apparent in its administration—to wit, selecting a managing agent who shall alone be trusted, separating the latter office from secretary, an auditor; and, lastly, a weigh-bridge. with, if possible, a self-registering indicator. Then may mining in Cornwall as a field for enterprise be recognised by capitalists.

St. Just, Nov. 13. R. B. SEARLE.

LEAD MINING IN DERBYSHIRE.

SIR,—I see in the *Mining Journal* of Nov. 3 a prospectus of a new company to open out and work old Ecton Mine again. As Captain Eddy remarks, the "mine is most interesting in its past history—richness, not only in quantity but in quality." There are only two veins—Ecton north and south and the Dutchman east and west—which Mr. Eddy will find if he refers to his father's notes. We were the last but one who worked the old mine; and I was at the last bottom workings, which, as I left it, was 457 yards. The junction of the two veins produced the pockets, cavities, or saps. Pockets is not a miner's term; cavities meaning on the incline or throw of two veins, with only the matrix and ore on the walls of clean limestone. As at Ecton, Parys Mountain, and Richmond, &c., saps. On the contrary the walls are lined with clay, such as you see in all red hematite veins in Lancashire, on the West Coast, Cumberland, and North Wales. The carbonates of zinc are always found in saps, not only in the rock limestone, as in North Wales, but in the strata veins, such as Farnbury, Holyfield, Alston Moor, and Cross Fell veins, in Cumberland. We took the lease of Ecton for working lead and blende for the zinc furnaces at Cheadle Copper and Brass Works, Messrs. Wilson Patten and Co. In the duke's time all the ores went to Whiston, the duke's own copper works.

The reason we gave up Ecton Mine was the duke's agents would not allow us to let the water into the bottoms. The wheel underground had not power to fork the water, our intention was to have let the water in up to Ape Tarr level, the second cavity. That would have lightened the weight, and the wheel would have then managed the water. We should have taken down the dam we erected at the Dutchman, and driven east on that vein, the only chance of any working to profit in the duke's royalty. On the north is the Dale Mine, Sir Richard Crews's. The Dutchman on the west goes into the same royalty, and on the South Cleator Mine. So you have only the latter and the east vein to work on. The vein at the bottoms throws 14 west magnetic; the limestone beds were as regular and as deep as at 40 yards from the surface. Three of the best miners the duke had at Ecton gave an account of the workings, and I found them to be quite correct. The cavity on the run of the vein was lead and blende, with calcareous spar, fluors in various colours, worked in the Dutchman's time. The second cavity was Ape Tarr, carbonate of copper—matrix, carbonate of lime—splendid working 20 yards wide and many fathoms deep, until it came on the black shale of the mountain lime, where they met with the throw of the two veins in junction, which caused the double saddle so much talked of by all the miners, and which now is thought to be two veins or more; but it really is only the shale distorted by the Ecton and Dutchman in junction, aiding on their strike. The old miners left large quantities of fine copper on the sides of that shale; it was to poor for their notice. Leaving the shale they lost the vein, not seeing the incline ade. (It was said it was at this time the duke took the workings of the mines into his own hands.)

A let to an old miner discovered the next cavity or great working 25 to 30 yards wide, carbonate of copper, matrix carbonate of lime cubes covered with copper pyrites, many fathoms deep, and took some years to work out. No lead or blende in these cavities. The next cavity was not so large, but equally as rich, 15 to 20 yards wide, 40 to 50 yards deep, and contained but little matrix, lime, and copper pyrites, with splendid cubes of carbonate of lime, the walls mostly limestone. The next was much smaller and seemed to be only part of another cavity not far off, most likely on the line of the vein running into Cleator Mine. And the last we worked for lead and blende on the dip east, the principal workings being west out of the boundary. The shafts and levels are all very good. Watt's first winding-engine was worked there for many years. The copper ores were all reduced in the duke's time at Ecton and Whiston, and the ores were so rich that they required the poorest sulphurous ores for their reduction, equal to the finest ores now obtained from South America.—*Grange-over-Sand, Nov.* 18. G. ATTWOOD.

WHEAL BASSET, AND ITS PROSPECTS.

SIR,—Can you give a few lines to a mine which is making rapid strides towards dividends? The accounts presented April, 1882, eight months' returns, 4 tons tin; that presented November, 1882, seven months' returns, 54 tons tin; that presented May, seven months' returns, 63 tons tin; and that presented Nov. 8, six months' returns, 97 tons tin. The last account shows an average of 16 tons per month compared with 9 tons in the previous account. A considerable increase is fully expected in the coming one. The agent's report concludes with the following remarks:—"We would moreover state that during the past six months our mine has considerably improved, especially in the 160 fathom level, which has enabled us to gradually increase our returns without materially adding to our working costs; and seeing that our bottom level still continues in a productive lode, where every fathom opened greatly enhances the value of the property, and with the prospect of intersecting a good lode in the 170 cross-cut within the next two months, we have every hope of still further increasing our returns, and that our loss, if any, will be comparatively small for the next account." Sixteen tons of tin per month in the last account cost no more to raise, &c., than the 9 tons in the previous one.—*Saffron Walden, Nov.* 15. JOHN GILLING.

THE RIO GRANDE DO SUL (BRAZIL) GOLD MINING COMPANY.

The directors of the above company have called an extraordinary meeting of the shareholders for the 21st inst., to pass a resolution for voluntarily winding-up the company, and, in the interests of morality and the public generally, it is expedient to draw attention to facts and matters which, to say the least of it, wear a very grave aspect, and bear in themselves the seed which has not only shaken public confidence in limited companies generally, but has produced a heavy crop of distrust, even amongst foreigners; hence, to a great extent, general depression in business has resulted. This company was founded in 1880, upon the express declaration contained in the Articles of Association—that the company and their regulations "shall be subject to the obligations of the Brazilian decrees, or convention, from time to time in force, and applicable to the company" (page 4, Article 3, Constitution) "and" (page 16, Section 16, Article 84 p., power and duties of the Board) "the doing of all things requisite for complying with the requirements of the statutes and the laws of Brazil, whether local or general, relating to the company, and this Article is fundamental." And, by the Imperial decree, No. 7793, of Aug. 26, 1880, the company was authorised to work upon two conditions only, the second of which enacts—"that all transactions and operations of the company within the empire shall be regulated by the laws of Brazil, and judged by their tribunals, without the company being able at any time to claim exception, by reason of anything contained to the contrary in their Articles." Now, the law (code Mercantile) relating to liquidation "within the Empire of Brazil, requires that the written consent of, at least, two-thirds of the shareholders must first be obtained;" it follows, therefore, that no resolution passed here can be of any validity without the consent of the Brazilian shareholders, for they represent 55,000*l.*, whereas those in this country represent only 25,000*l.*, otherwise the former owners of the property in Brazil, who, as stated (in the original prospectus, issued by the directors here) "evinced their perfect confidence in the future prospects under English auspices, by accepting the whole purchase money in fully paid-up shares—43,000*l.*, of which they agreed to take in deferred shares' warrants, receiving no dividend unless 10 per cent. has been paid in each and every year on the whole subscribed capital of the company, and the remainder 12,000*l.* in fully paid A preference shares," and this, upon a special condition (to be alluded to hereafter), would be entirely wiped out, and lose the whole of the very valuable property and plant transferred to the English company, enabling the directors, who have been the sole cause of the present collapse, to become the possessors of the company, at the expense of the vendors, with the tempting bait held out of its reconstruction in the future. However, no order of the Court here for sale of the property under such conditions would be permitted there; so much then for the morality of that part of the transaction by the board; but there is another reason to cover the delinquencies of the directors.

In their special report just issued they state "that this company was established in the early part of 1880, on the special report of Mr. Hubert Bankart. His statement was that the Aurora, Serrito, and Silva Mines would within 18 months, if placed in proper working order, produce 4500 tons of ore, worth 5*l.* 5s. a ton, taking the average of the ore to be 1½ oz. to the ton." They proceed to state in the next paragraph, "Mr. Bankart's estimate of the necessary expenditure for the first year was 11,000*l.*" This is entirely erroneous—*vide* my report. I never gave any estimate whatever for 12, but for 18 months—19,000*l.* for each of the three mines.

As corroborating or otherwise Mr. Bankart's report of the value of the property reference need only be made to paragraph sixth in the director's report, thus—"Mr. Henry Clemes (who, as stated by Mr. Bergtheil at the June, 1881, meeting was sent out by the directors, after they had been enjoying 14 months' emolument, went out to find fault and see if the statements upon which the property had been sold were true or false, and his mind prejudiced against it, as they had informed him that they did not believe that the ore I had sent h'd ever come from there), in his address to the shareholders at a meeting held on June 14, 1881, speaking of the Aurora Mine, said—"So far as I can judge, if you work the mine from the lode already partially developed the exceptionally rich parts of the lode will yield a very high percentage, and that the lode will probably yield for a limited width (say), from 1 ft. wide, from 10 to 20 ozs. to the ton, and for 4 ft. wide from 2 to 3 ozs. to the ton. It is rarely in my travels during the last 50 years through the whole of North America, Brazil, and other parts of the world, that I have seen such a property. I have seldom seen a better property for the extent opened than that which this company possesses, and with a really good, honest, and clever man to manage it you would have a very valuable property." The next paragraph then goes on to state—"On the recommendation of Mr. H. Clemes, Mr. Henry Eddy was sent out as superintendent, and he arrived at the mines in December, 1881. His report on the Aurora was as follows:—As far as I have seen of the lode in the eastern shaft and adjacent workings it has a very promising appearance, being along the bottom of the shaft 6½ ft. wide, and on an average in the stopes 4 ft. wide. In addition to the regular lode there are numerous veins 4 to 8 in. wide dropping into. This is a very strong and masterly lode, as comparatively few lodes give an average width of over 5 ft., and when a lode of this kind gives an average width of profitable ore from 2½ to 3 ft. wide I consider it one of the few prizes so seldom met with in modern gold mining."

Now, after two years' working by Mr. Eddy under the same board what is the result obtained? The expenditure of the whole of the capital (with the exception of a small amount of unpaid calls—1200*l.*—by one of the principal shareholders and promoters) in simply prospecting this ground, with perhaps a more definite knowledge of the general diffusion of gold. Can any board have more stultified itself by its acts? Paragraph 13 refers to reduction works as so strongly recommended by Mr. Clemes and Mr. Eddy, but which were certainly not endorsed by the latter gentleman; for, in his letter to the board, Feb. 27, 1882, he says—"Looking at Mr. Clemes' section of the mine, a misrepresentation greater than anything ordinarily met with (!), and adding to this his estimate for reduction works, I think the directors will see that my duty is anything but a pleasant one." The directors add that "they have taken every possible step in their power to raise the necessary additional capital, but without success;" and, in paragraph 14 "they proposed to the shareholders to issue debentures for the purpose of draining the Lagoa" (a most unwise proposition in the present state of affairs)" but failed to obtain subscriptions;" and in paragraph 15—"The shareholders have authorised the board to issue debentures, but none have as yet been placed, in spite of every endeavour to do so. The directors, in the face of the above reports, can only attribute their non-success in raising capital to the fact of the prevailing mistrust in mining enterprise, and especially gold mining."

Rather is their non-success to be attributed to their gross mismanagement throughout, and to the universal mistrust in the present directors, who lack every essential necessary to the success of a company, and to the lawsuit with myself, which is pending for the last two years, and which, rather than give every facility to try and face in open Court, or meet in an honourable spirit, they now propose to wipe out by liquidation, after having used every available means to delay and postpone the trial. My solicitors, writing on the 30th ult. (three days before this special meeting of the board), in announcing that the defendants' solicitors had sent them the draft order for a commission to go to Rio to take evidence (the order was taken on July 20), for them to approve in the usual way, say:—"The preparation for and sending it out will create a further delay in the trial of the action of nine months, and will cost you at least 30*l.* to join in it; and there really can be no doubt that the company's only object is to delay the trial and wear you out." To the company the cost of the commission would probably reach 1000*l.* Is it, then, likely that anyone would take their debentures or bring fresh capital into the concern whilst a lawsuit was pending? In the fourth paragraph we read:—"The directors refrain from referring to the differences that arose with Mr. Bankart, who had proceeded to the mines as the manager in December, 1880 (and authority given to dismiss him within a month). Sufficient to say that the directors felt themselves compelled to send Mr. Clemes to Rio in January, 1881, and the result was Mr. Bankart's dismissal. They much regret that before Mr. Bankart left in August the company's working capital to the extent of 15,000*l.* had been expended."

No wonder that the directors refrain from referring to the differences; had they done otherwise, the revelations would have stultified themselves, and exposed them to the scorn of all right-minded people. Now, this natural inference from the directors statement is that I had expended the 15,000*l.*, whereas every penny that passed through my hands for all purposes from the time I first went out until I arrived in England in October, 1881 (18 months), was 5715*l.*, including salary, out of which I paid for 100 shares. The directors spent the rest, including, up to that date, 1800*l.* for their own fees and about 700*l.* to the secretary, and during the few weeks Mr. Bankart was in charge at the mines he sent home 25 cwts. of exceedingly rich ore, out of which the directors sold 15 cwts., yielding 64 ozs. of gold to the ton, besides taking out, as declared by Mr. Clemes, 200 tons which, from his sample, assayed 3½ ozs. to the ton, and which should thus have produced over 24,000*l.*, but was reduced under the board's instructions with useless "machinery," or rather "appliances," at hand, and turned out only ¾ oz. to the ton, Mr. Eddy adding that a great deal was lost, as the gold was contained in the pyrites, and that, as Mr. Bergtheil stated, the pile was salted by Mr. Bankart, so admirably that Mr. Clemes was deceived by it. Now let us see what the difference arose from, and how the lawsuit originated. I was sent out by the original promoters to examine the property and make the terms of purchase, and the condition the vendors made imperative was that if they waived their claim for cash and accepted deferred share warrants for 80 per cent. of their purchase-money, Mr. Bankart should be appointed resident chief engineer and superintendent for the first five years, and that this should be inserted in the Articles of Association as a guarantee against the depreciation of their scrip by changing managers.

This was accordingly inserted in the Articles of Association, and then the board added "subject to a contract to be entered into afterwards." Now, by this contract it endorsed the clause in the Articles of Association, and conferred upon the manager full power specifying that he could only be dismissed for "wilful misconduct," and then only upon payment to him of 1500*l.* Subsequent to the entering into this contract the board requested me to undertake the completion of the purchase on their behalf in Rio Janeiro, and to this end finally provided me with a power of attorney giving me "special and unlimited authority to do all and everything that I might consider necessary, binding themselves to accept and ratify the same." During the negociations many unpleasant occurrences with the board and vendor took place, and finally one of the promoters (since dead) went out and threatened to wind up the company; this incensed the vendors, who inserted a clause in the conveyance that as they had not received any return of a substantial character for the property which they were about to hand over in the event of the company in England going into liquidation before the expiration of five years that the property should revert to the vendors. This was modified to three years and accepted by me on behalf of the company as being just, equitable, and in accordance with the laws of Brazil. After the complete ratification of everything by me under that power, and the board receiving my letter with a full explanation upon these matters, as also one from the vendors, and before I knew of any objection on the part of the board, having left to take charge at the mines 1000 miles away, I found that they had already made arrangements to send out Mr. Clemes to try and upset the clauses in the conveyance and dismiss me, my salary they had already stopped. Hence the present action for illegal dismissal.

But let us ponder for a moment upon the matters to be expunged, which were to wit—Firstly, the last clause in the conveyance called the "reversion clause"; secondly, in the clause relating to liquidation "without having obtained full knowledge of at least two-thirds of the holders of share warrants, as the laws of Brazil expressly determine"; thirdly (I transcribe exactly from their new addenda to the conveyance), in the part in which is said "the company shall not be entitled at any time whatever to allege exemption under the Articles of Association"; fourthly, the clause relating to Mr. Bankart's not being dismissed by the board or resign on his part "save from illness, accident, or other cause proved by him"; fifthly, the part in which it is said "the aforesaid H. Bankart, through his constituents, binds himself to admit by the aforesaid company in London, and that with antecedence, the shares which may be required, so that the necessary means and funds may never fail." Now, the registered plea of the board in the action pending is that under the power of attorney I had been guilty of "wilful misconduct" in allowing the insertion of the clauses (reversion and others), the value and utility of which are self apparent now, though, indeed, it was made evident immediately after its ratification, as the contracts entered into by the board with the artizans they sent out from England contained a provision for the company going into liquidation after the expiration of 12 months, showing which way the wind blew. The President of the Stock Exchange wrote on Feb. 14, 1881, from Rio, refusing to expunge the clause "as the bearing of the clause is to prevent litigation in case of the company's stopping, because in the event of such a thing taking place before the whole capital is paid up, we can, according to the laws of this country, clause or no clause, prevent them from taking possession of the property.—Signed, HENRY HARPER.

Any business transacted by virtue of a power of attorney must, in accordance with the terms of that power, be binding upon the parties represented by their attorney, and although in this case, the power was "special and unlimited," the board took upon itself to set it all aside and issue a new power of attorney to a second party to cancel and make void the acts of the first. The law here, unfortunately, instead of facilitating the exposure and punishment of such conduct, materially assists them in their dishonest attempts, and grants incessant delays upon the flimsiest pretexts, which when at last before the Tribunal will be found without the remotest shadow of truth to sustain them, and all this to wear out the suitor.

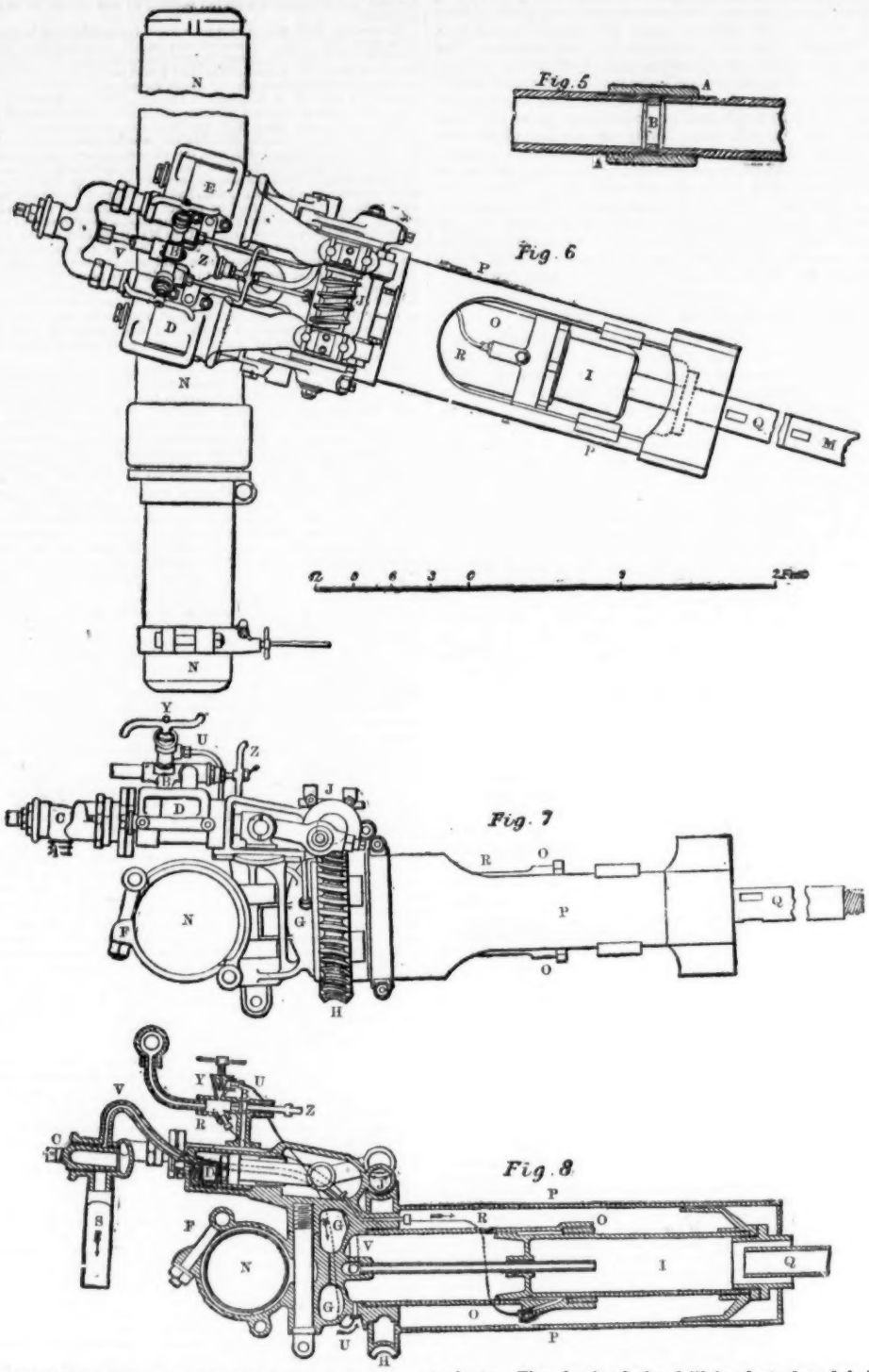
To recapitulate. 1.—It is evident that any resolution of the English shareholders passed at the meeting called for the 21st inst. to wind up the company and appoint a liquidator cannot be operative as regards the company's property in Brazil, as the first, second, third, and fifth clauses objected to are either the law of Brazil or the special Imperial Decree, and a company here might as well pass resolutions to set aside our statutes, which would be *ultra vires*, and, therefore of none effect as to pretend by their acts to render nugatory the Imperial edicts of Brazil, and, as is well known, the vendors accepted, and still hold, more than two-thirds of the entire share capital issued, not having received a penny in cash for their property, whilst the injustice of the proposals thus to wind up the company before the Brazilian shareholders can have cognizance of the proposed meeting, which requires to be duly advertised is too glaring to require comment.

2.—As to the value of the mines there cannot well be two opinions as to the value of the property secured by the company without any cash payment to the vendors, and the reports of the persons sent out to supersede my management more than confirm the estimate in my report of July 9, 1879, as to the gold bearing lodes. Nevertheless, under the incompetent management of the directors and their agents, the whole capital of the company, except a small amount of unpaid calls, has been so unprofitably expended that the shareholders have never received a fraction of dividend. The directors' imputation that the company's working capital to the extent of upwards of 15,000*l.* had been expended under my management being marked by characteristic unfairness in the teeth of the fact that only 5715*l.* ever passed through my hands. I may add that the original decrees and titles are not, and never have been, in the hands of the company. I have only further to add that I have offered to submit my claim under the Articles of Association to arbitration; that I have made an offer of a very liberal compromise of my claim, so as to assist them in raising fresh capital; and that I have done all in my power to bring the hearing of my claim to a speedy issue before the Court, but the directors have refused the repeated offer of arbitration and compromise on account of the state of the company, and I am still willing to compromise. They have done all in their power to delay the judicial hearing of the case.—HUBERT BANKART.

SPANISH MINES, AND PRICES OF COPPER.—The exports of copper stuff from Huelva alone in a great measure account for the depression in the price of copper in this country. Mr. Consul Young writes that the articles of exportation from Huelva in 1882 embraced as usual cupreous sulphur ore, precipitate of copper, iron and manganese ore, cork, wine, and fruits. The amount of cupreous sulphur ore exported reached a total of 518,088 tons; of precipitate of copper (containing about 75 per cent. of pure copper), 31,264 tons; of iron ore, 13,124 tons; of wine, 2,037,900 litres; of manganese, 3990 tons; of grapes, 14,763 kilos.; of cork, 50 tons. With the exception of the wine that was sent to France and Germany, the iron ore exported to Philadelphia, several cargoes of cupreous sulphur ore for Holland, and one cargo of the same for Denmark, the whole of the above-mentioned exports were sent to Great Britain and in British bottoms.

NEW GUINEA, AND GEOGRAPHICAL RESEARCH.—The inaugural meeting of the winter session, which commenced on Monday evening, was a particularly interesting one, and was attended by M. de Lesseps and a number of geographical celebrities. The President, Lord Aberdare, in reviewing recent advances in geographical research, remarked that events connected with New Guinea were exciting a keener interest than ever in that vast island, of which, with slight and rare exceptions, only the outer circumference had been visited. With regard to the exploration of New Guinea, he said no time would be lost in considering the subject conjointly with the committee appointed by the British Association at Southport. It seemed before all things desirable that knowledge, full and trustworthy, unbiassed by commercial speculations and visions of territorial aggrandisement, should be acquired and disseminated with the least possible delay; and he ventured to think that this knowledge, which ought to precede any decisive action either by the Imperial or Colonial Governments, could be most effectually obtained by purely scientific exploration, directed, as further consideration might suggest, on one or more lines of advance. To act in ignorance either of the character of the people to be encountered or of the country to be colonised seemed not only the height of rashness, but a course which might gravely affect the fair fame of England, and bring shame upon those who valued her reputation, while it would confirm much that our bitterest enemies had said of our insatiable greed of territory, and of the high-handed and remorseless fashion in which we gratify that passion. With so important an object before them, they might indulge a sanguine hope of receiving the sympathy and assistance of Government.

INSTITUTION OF MECHANICAL ENGINEERS—THE BRANDT ROCK-DRILL.



INSTITUTION OF MECHANICAL ENGINEERS—THE BRANDT ROCK-DRILL.

The holing of the Arlberg Tunnel within the time stipulated causes much interest to attach to the boring machinery used there, inasmuch as, owing to the higher rate of progress achieved as compared with all previous tunnelling operations, those contemplating similar work will naturally desire to ascertain whether the drills used possess any peculiar recommendation. Fortunately, with regard to one of the drills employed, and that which displays the greatest novelty, the volume of "Transactions of the Institution of Mechanical Engineers," just issued, contains full details. The volume contains the full report of the Belgian meeting, with the papers read, and the discussion which arose upon them. The papers read were—"On the History of the Iron and Coal Industries in the Liége District," by Mr. E. D. Laveleye; "On the Manufacture of Zinc in Belgium," by Mr. St. Paul de Sinçay; "On the Application of Electricity to the Working of Coal Mines," by Mr. A. C. Bagot; "On Compound Locomotive Engines," by Mr. F. W. Webb; "On the Construction and Working of the St. Gothard Railway," by Mr. E. Wendelstein; and "On the New Harbour Works at Antwerp," by Mr. G. A. Royers. Abstracts of the several papers were published in the *Mining Journal* at the time of the meeting; but a further abstract from Mr. Wendelstein's paper, giving full details concerning the Brandt drill, being of more than usual interest, is now subjoined.

With reference to the spiral tunnels Mr. Wendelstein confines himself to a description of the Pfaffensprung Tunnel, the lowest on the northern side. This tunnel, which is 1460 metres in length (1600 yards), is remarkable as having been driven chiefly by the Brandt drill, which is a rotary drill worked by hydraulic power. This drill has since been employed with great success at the eastern end of the Arlberg Tunnel. The apparatus required for the Brandt drill consists of two high-pressure pumps with differential pistons, driven by a turbine; of an accumulator; and of a regulating valve, intended to regulate the pressure and prevent shocks, both within the drill itself and in the pipe leading to it. This pipe is of wrought-iron 38 millimetres in diameter (1½ in.). The joints are made by screwed sleeves A (Fig 7) which pass over the ends of the pipes. A copper ring B is fitted between the ends, each of which is brought to a sharp edge entering a groove in the copper. The ends being screwed left and right hand respectively, the tendency of the sleeve is to draw the two ends together, thus causing them to bite into the copper and make a firm joint. The pressure is 80 to 100 atmospheres, or from 1200 to 1500 lbs. per square inch.

The machine itself is shown in Figs. 8, 9, and 10, in plan, elevation, and longitudinal section. A socket piece G, which is moveable about a piece F connected to a horizontal shaft N, carries the boring cylinder O. Within the cylinder is a hollow plunger I, which is pushed forwards by the pressure, and forces against the rock a steel drill M (Fig. 8) screwed on the piston-rod Q. The total pressure on the drill is from 10,000 to 12,000 kilometres (10 to 12 tons). To the socket G are attached two small hydraulic motors, D and E, of about 13-horse power each; these actuate by cranks a shaft carrying a worm J. This worm gears with a worm-wheel H, turning loose upon the cylinder O. The wheel H is solid with the outside cylindrical casing P, on which slide the piston-rod guides; the rotation of the casing by the wheel H accordingly turns the piston and piston-rod, and therefore the drill itself at a speed of 7 to 10 revolutions per minute. The shank of the drill is of steel, and hollow, having a diameter of about 64 millimetres (2½ in.), whilst the cutting edge or crown is widened out to about 2¾ in. diameter. This edge has four teeth like a saw, carefully hardened; the teeth are re-sharpened as they wear down. The shank is made in pieces of a fixed length, which can be easily screwed one to the other as required.

The working of the machine is carried on by means of the valve-chest B, which contains a single stop-cock Z admitting the pressure-water simultaneously into the branch pipe leading to each of the motors D and E, and a two-way cock Y for producing the forward or backward movement of the drill-plunger I. By opening this cock the pressure of water is admitted through the pipe U to the rear of the plunger where it acts upon the full area of the plunger to press the drill forwards against the rock, and on closing the cock the drill is drawn back by the water-pressure acting constantly upon the small annular area in front of the plunger-piston through the pipe R. By partly closing the cock Y the pressure on the rear of the plunger and therefore upon the drill can be moderated. The attention required is so small that one man can easily manage two or more machines.

The hole can be washed out, to clear it of debris, by closing the cock C in the pipe leading from the motors to the escape-hose S. The exhaust water from the engines, instead of escaping at once, is then led through the copper-pipe V into a pipe running along the centre of the cylinder O, and opening into the inside of the plunger I. From thence it passes along the hollow piston-rod and drill, and escapes at the face. The supporting shaft N consists of a tube with a plunger fitted in it. By admitting the pressure-water to the interior the plunger-head is forced out against the side of the heading, and the shaft is thus set fast. The plunger can be withdrawn by means of a two-way cock in the same way as that of the working cylinder. The shaft and drills are carried on a small wheeled-truck, and are counterbalanced so as to be in equilibrium when the shaft is not fixed. The shaft can be swung round parallel to the line of the heading so as to occupy less room when advancing or retiring.

The mode of operation with the machine is as follows:—The truck having been brought up to the face of the heading a distributing piece with connecting lengths between is screwed on to the end of the main-pressure pipe. A copper pipe transmits the water-pressure from the main to the shaft N. This shaft is swung round across the heading at a distance from 5 to 6 ft. behind the face, and a turn of the cock is sufficient to fix it to the sides. The drills are then connected by other pipes to the distributing piece, and directed to the proper points of the face. The stops-cocks are then opened and the boring commences. The total feed of the drill is 9·84 in. When its full range has been reached the two-way cock is closed so as to withdraw the drill, and another length is screwed on to the shank. The operation is thus continued until the hole has reached a depth of from 40 to 48 ins. The depth to which a drill will bore before it requires sharpening depends of course upon the hardness of the rock. In the granite and quartzite of the Pfaffensprung Tunnel this depth varied from 8 to 20 ins., but in limestone or dolomite it has reached 10 metres (32·8 ft.). The number of holes pierced at one time varies from four to six. As soon as they are finished the drills are withdrawn while the charging commences. When the shots have been fired water from the pressure main is projected through a pipe with a rose on the end against the face of the working, and serves both to absorb the fumes of the dynamite and to cool the air. The efficiency of the Brandt drill may be judged of from the particulars in the subjoined table, which relate to its performance in the very hard rock of the Pfaffensprung Tunnel in the spring of 1880—

Particulars per Month.		1880. April.	May.	June.
Nature of rock (granite gneiss)		hard	hard	compact
Mean transverse section of heading	sq. m.	7·0	6 5	6·0
	sq. ft.	75·35	69·97	64·58
Total advance during month	m.	58·8	61·7	44·6
	ft.	192·9	202·4	146·2
Number of machines working together		2	2	2
,, attacks		73	56	53
,, hours worked		700	612	610
,, machines withdrawn for repairs		1	1	0
,, drills changed for sharpening		2124	1586	2638
Mean pressure of water at heading	atm.	100	100	100
Dynamite used	kg.	935	589	702
	lb.	2060	1300	1550
Particulars per Day.				
Mean advance of heading	m.	1·96	1·99	1·49
	ft.	6·43	6·53	4·89
Maximum ,,	m.	3·00	4·00	3·70
	ft.	9·84	13·12	12·13
Particulars per Attack.				
Mean advance of heading for one attack	m.	0·80	1·10	0·8e
	ft.	2 62	3·61	2·76
Time occupied—Drilling	hr. m.	5·56	6·07	8·01
Removing spoil	hr. m.	3·42	4·55	3·29
Total	hr. m.	9·38	11·02	11·30
Mean number of holes drilled		6·10	6·25	7·37
Mean depth of holes	m.	1·05	1·15	1·04
	ft.	3·44	3·77	3·41
Mean diameter of holes	mm.	70	70	70
	in.	2·75	2·75	2·75
Particulars per Metre Advance of Heading.				
Number of attacks		1·24	0·91	1·19
Time occupied—Drilling	hr. m.	7·21	5·34	9·32
Removing spoil	hr. m.	4·35	4·23	4·08
Total	hr. m.	11·56	9·57	13·40
Mean number of holes drillied		7·50	5·67	8·78
Number of machines withdrawn for repairs		0·02	0 02	0·08
,, drills changed		38·12	29·80	59·00
Dynamite used	kg.	15·90	9·55	15·70
	lb.	34·98	21·01	34·54

The driving of the Pfaffensprung Tunnel was commenced by hand, and a heading of 67 metres long (220 ft.) at the north end, and 34 metres (112 ft.) at the south end was so driven. The first machine drill used was on the Frölich system, worked by compressed air; and the following Table gives a comparison of the work done by this system and by hand labour, with the work subsequently done in the same tunnel by the Brandt hydraulic drill. It will be seen that after three months' use of the Frölich drill, during which time there had been several accidents, the progress was not equal to that which had been laid down in the estimate, and it was for this reason that the Brandt drill was substituted:—

Daily Average.	Frölich Drill. Date.	M.	Ft.	Brandt Drill. Date.	M.	Ft.	Handworking. North End. M.	Ft.	South End. M.	Ft.
Minimum	Dec. 79	1·0	3·28	July 80	1·5	4·92	0·4	1·31	0·4	1·31
Maximum	Jan. 80	1·3	4·26	Dec. 80	2·6	8·53	0·8	2·62	0 9	2·95
Average	—	1·15	3·87	—	2·05	6·73	0·61	2·00	0·66	2·16

The variation in the progress between the minimum and maximum here shown depends, of course, on the nature of the rock. Although the rock in this tunnel was of the hardest character, yet, thanks to the employment of the Brandt drill and of the English method of driving—by making the leading heading at the bottom—this tunnel was completed more quickly than any other spiral tunnels. These were mainly driven by means of the Frölich drill. On the whole it may be considered that the Pfaffensprung Tunnel, 1476 metres long (1614 yards) was completed in 2½ years' work.

ECONOMIC TREATMENT OF PEAT.

Some improvements connected with the mode of cutting, collecting, compressing, drying and treating raw peat from bogs have been invented by Mr. JOHN KENDALL, of Kingston Hill. He pares off the surface of the bog mechanically by means of a special cutting implement the knives of which are arranged horizontally at any convenient angle and at a depth from the surface which can be regulated as desired, and are fixed to a travelling frame fastened to a wire or other rope hauled by horse, steam, water, electric, or other power, in manner somewhat similar to that in which a steam-plough is worked on arable land. The surface of the bog having been removed he cuts the bog vertically *in situ* by machinery (several cuts being made longitudinally at the same time) by means of a special cutting implement having vertical knives fixed to a travelling frame fastened to a rope hauled as above-mentioned, the said cuts being made parallel to each other and to a width and depth which can be regulated as desired. He then cuts the same bog by the same implement transversely and more or less at right angles. Then by the implement first above-mentioned he undercuts the bog horizontally Sometimes he combines the two operations in the same implement, whereby the vertical cuts in one direction and the under cuts are made simultaneously, and in this case he sometimes employs wires in lieu of or in addition to vertical knives. He makes the implements reversible, whereby they can be worked each way without delay

The combined effect of these operations is to mechanically cut the natural peat bog *in situ* into any desired shapes and size, which shapes can be easily collected by manual labour and placed in trucks and wheeled to the compressing machinery, or such shapes may be collected and conveyed by means of a scoop collector or sledge hauled as before-mentioned. He dries the peat by compression by means of special machinery for that purpose, the fluids being expressed and the fibrous matter compressed for transport by one and the same operation. For this purpose he sometimes passes the peat between or under rollers, and sometimes he employs hydraulic or other presses. The final drying process he performs in a covered shed, which is sometimes heated by flues or pipes, through, over, under, or by which he conveys the compressed peat from the compressing machinery by means of an endless carrier. Thus he makes up the compressed and dried peat into bales for the consumer almost immediately after cutting the wet peat from the raw bog.

NEW LAMP FOR PIT BANKS AND MINES.—That work can be better and more quickly performed when the pit bank or dressing-floor is well illuminated is universally acknowledged; and during the winter months we are so long dependent upon artificial light that a good lamp is a desideratum. Under the name of the "English" lamp, Mr. ALEX. KELLY, of Epping, is now introducing an improved lamp (pat. 1883), which burns petroleum or paraffin oil without using a glass chimney, is not affected by wind or oscillating movement, and is proved to be the most economical lamp in the market. The advantages claimed for the English lamp are that by using a crescent-shaped burner, and the flame impinging upon the curved cone surmounting it, the light is much intensified, and the photometric value of the side equal to the breadth; by placing the burner diagonally the light is distributed equally through all four panes of glass; the lamp is the same in appearance and size as an ordinary street gas lamp; the average economy as against gas is about 65 per cent.; all cost of laying pipes, &c., is avoided; the patent burner reduces the cost of wick and trimming to a minimum; the wick only requires to be raised about the tenth of an inch above the level of the wick holder; a rub of the finger over the charred part is all the trimming it requires; the reservoir holds a pint and an eighth, and will give a clear white light for 18 to 20 hours; and the flame is regulated from the outside by a movable key, so that no opening and shutting of doors is required. The lamp has already been extensively adopted, and in every case has given great satisfaction.

HOLLOWAY'S PILLS — ENFEEBLED EXISTENCE. — This medicine embraces every attribute required in a general and domestic remedy; it overturns the foundations of disease laid by defective food and impure air. In obstructions or congestions of the liver, lungs, bowels, or any other organs, these pills are especially serviceable and eminently successful. They should be kept in readiness in every family, as they are a medicine without a fault for young persons and those of feeble constitutions. They never cause pain, or irritate the most sensitive nerves, or most tender bowels. Holloway's pills are the best known purifiers of the blood, and the best promoter of absorption and secretion, and remove all poisonous and obnoxious particles from both solids and fluids.

THE NEW PATENT, DESIGNS, AND TRADE MARKS ACT.—No. V.

EXISTING PATENTS.

45.—(1) The provisions of this Act relating to applications for patents and proceedings thereon will have effect in respect only of applications made after the commencement of this Act. (2) Every patent granted before the commencement of this Act, or on an application then pending, will remain unaffected by the provisions of this Act relating to patents binding the Crown, and to compulsory licenses. (3) In all other respects (including the amount and time of payment of fees) this Act extends to all patents granted before the commencement of this Act, or on application then pending in substitution for such enactments as would have applied thereto if this Act had not been passed. (4) All instruments relating to patents granted before the commencement of this Act required to be left or filed in the Great Seal Patent Office will be deemed to be so left or filed if left or filed before or after the commencement of this Act in the Patent Office.

DEFINITIONS.

46.—In and for the purposes of this Act—"Patent" means letters patent for an invention: "Patentee" means the person for the time being entitled to the benefit of a patent: "Invention" means any manner of new manufacture the subject of letters patent and grant of privilege within section six of the Statute of Monopolies (that is, the Act of the twenty-first year of the reign of King James the First, chapter three, intituled "An Act concerning monopolies and dispensations with penal laws and the forfeiture thereof"), and includes an illeged invention. In Scotland "injunction" means "interdict."

PART III.—DESIGNS.—REGISTRATION OF DESIGNS.

47.—(1) The comptroller may, on application by or on behalf of any person claiming to be the proprietor of any new or original design not previously published in the United Kingdom, register the design under this part of this Act. (2) The application must be made in the form set forth in the First Schedule to this Act, or in such other form as may be from time to time prescribed, and must be left at, or sent by post to, the Patent Office in the prescribed manner. (3) The application must contain a statement of the nature of the design, and the class or classes of goods in which the applicant desires that the design be registered. (4) The same design may be registered in more than one class. (5) In case of doubt as to the class in which a design ought to be registered, the comptroller may decide the question. (6) The comptroller may, if he thinks fit, refuse to register any design presented to him for registration, but any person aggrieved by any such refusal may appeal therefrom to the Board of Trade. (7) The Board of Trade shall, if required, hear the applicant and the comptroller, and may make an order determining whether, and subject to what conditions, if any, registration is to be permitted.

48.—(1) On application for registration of a design the applicant must furnish to the comptroller the prescribed number of copies of drawings, photographs, or tracings of the design sufficient, in the opinion of the comptroller, for enabling him to identify the design; or the applicant may, instead of such copies, furnish exact representations or specimens of the design. (2) The comptroller may, if he thinks fit, refuse any drawing, photograph, tracing representation, or specimen which is not, in his opinion, suitable for the official records.

49.—(1) The comptroller will grant a certificate of registration to the proprietor of the design when registered. (2) The comptroller may, in case of loss of the original certificate, or in any other case in which he deems it expedient, grant a copy or copies of the certificate.

COPYRIGHT IN REGISTERED DESIGNS.

50.—(1) When a design is registered, the registered proprietor of the design must, subject to the provisions of this Act, have copyright in the design during five years from the date of registration. (2) Before delivery on sale of any articles to which a registered design has been applied, the proprietor must (if exact representations or specimens were not furnished on the application for registration), furnish to the comptroller the prescribed number of exact representations or specimens of the design; and if he fails to do so the comptroller may erase his name from the register, and thereupon his copyright in the design will cease.

51.—Before delivery on sale of any articles to which a registered design has been applied, the proprietor of the design must cause each such article to be marked with the prescribed mark, or with the prescribed word or words or figures, denoting that the design is registered, and if he fails to do so the copyright in the design will cease, unless the proprietor shows that he took all proper steps to ensure the marking of the article.

52.—(1) During the existence of copyright in a design, the design will not be open to inspection except by the proprietor or a person authorised in writing by the proprietor, or a person authorised by the comptroller or by the court, and furnishing such information as may enable the comptroller to identify the design, nor except in the presence of the comptroller, or of an officer acting under him, nor except on payment of the prescribed fee; and the person making the inspection will not be entitled to take any copy of the design, or of any part thereof. (2) When the copyright in a design has ceased, the design will be open to inspection, and copies thereof may be taken by any person on payment of the prescribed fee.

53.—On the request of any person producing a particular design, together with its mark of registration, or producing only its mark of registration, or furnishing such information as may enable the comptroller to identify the design, and on payment of the prescribed fee, it will be the duty of the comptroller to inform such person whether the registration still exists in respect of such design, and if so in respect of what class or classes of goods, and stating also the date of registration, and the name and address of the registered proprietor.

54.—If a registered design is used in manufacture in any foreign country, and is not used in this country within six months of its registration in this country, the copyright in the design will cease.

REGISTER OF DESIGNS.

55.—(1) There is to be kept at the Patent Office a book called the Register of Designs, wherein will be entered the names and addresses of proprietors of registered designs, notifications of assignments, and of transmissions of registered designs, and such other matters as may from time to time be prescribed. (2) The register of designs will be *prima facie* evidence of any matters by this Act directed or authorised to be entered therein.

FEES.

56.—There are to be paid in respect of applications and registration and other matters under this part of this Act such fees as may be from time to time, with the sanction of the Treasury, prescribed by the Board of Trade; and such fees shall be levied and paid to the account of Her Majesty's Exchequer in such manner as the Treasury shall from time to time direct.

INDUSTRIAL AND INTERNATIONAL EXHIBITIONS.

57.—The exhibition at an industrial or international exhibition certified as such by the Board of Trade, or the exhibition elsewhere during the period of the holding of the exhibition, without the privity or consent of the proprietor of a design, or of any article to which a design is applied, or the publication, during the holding of any such exhibition, of a description of a design shall not prevent the design from being registered, or invalidate the registration thereof, provided that both the following conditions are complied with:—(*a*) The exhibitor must, before exhibiting the design or article, or publishing a description of the design, give the comptroller the prescribed notice of his intention to do so; and (*b*) The application for registration must be made before or within six months from the date of the opening of the exhibition.

LEGAL PROCEEDINGS.

58.—During the existence of copyright in any design—(*a*) It will not be lawful for any person without the license or written consent of the registered proprietor to apply such design or any fraudulent or obvious imitation thereof, in the class or classes of goods in which such design is registered, for purposes of sale to any article of manufacture or to any substance artificial or natural, or partly artificial and partly natural; and (*b*) It will not be lawful for any person to publish or expose for sale any article of manufacture or any substance to which such design or any fraudulent or obvious imitation thereof shall have been so applied, knowing that the same has been so applied without the consent of the registered proprietor. Any person who acts in contravention of this section will be liable for every offence to forfeit a sum not exceeding fifty pounds to the registered proprietor of the design, who may recover such sum as a simple contract debt by action in any court of competent jurisdiction.

59.—Notwithstanding the remedy given by this Act for the recovery of such penalty as aforesaid, the registered proprietor of any design may (if he elects to do so) bring an action for the recovery of any damages arising from the application of any such design, or of any fraudulent or obvious imitation thereof for the purpose of sale, to any article of manufacture or substance, or from the publication, sale, or exposure for sale by any person of any article or substance to which such design or any fraudulent or obvious imitation thereof shall have been so applied, such person knowing that the proprietor had not given his consent to such application.

DEFINITIONS.

60.—In and for the purposes of this Act—"Design" means any design applicable to any article of manufacture, or to any substance artificial or natural, or partly artificial and partly natural, whether the design is applicable for the pattern, or for the shape or configuration, or for the ornament thereof, or for any two or more of such purposes, and by whatever means it is applicable, whether by printing, painting, embroidering, weaving, sewing, modelling, casting, embossing, engraving, staining, or any other means whatever, manual, mechanical, or chemical, separate or combined, not being a design for a sculpture, or other thing within the protection of the Sculpture Copyright Act of the year 1814 (fifty-fourth George the Third, chapter fifty-six). "Copyright" means the exclusive right to apply a design to any article of manufacture or to any such substance as aforesaid in the class or classes in which the design is registered.

61.—The author of any new and original design will be considered the proprietor thereof, unless he executed the work on behalf of another person for a good or valuable consideration, in which case such person shall be considered the proprietor, and every person acquiring for a good or valuable consideration a new and original design, or the right to apply the same to any such article or substance as aforesaid, either exclusively of any other person or otherwise, and also every person on whom the property in such design or such right to the application thereof shall devolve, shall be considered the proprietor of the design in the respect in which the same may have been so acquired, and to that extent, but not otherwise.

Registration of New Companies.

The following joint-stock companies have been duly registered:—

THE HONDURAS MINING SYNDICATE (Limited).—Capital 2000*l.*, in shares of 1*l.* To adopt and carry into effect a certain agreement made between M. L. Aguilera of the one part, and the company of the other, and generally to promote, establish, develope, manage, or otherwise deal in any shares or interests in said or any other similar company. The subscribers (who take five shares each) are—H. van Straubenzie, Darlington, hon. colonel; W. Berry, Wool Exchange, merchant; M. St. John, 9, New Broad-street, gentleman; E. S. Morris, 9, Fenchurch-street, auctioneer; J. Luttman, 86, Lyndhurst-grove, accountant; H. Richards, 4, The Sanctuary, accountant; R. Y. Corkling, 8, Northumberland-terrace, gentleman. (No Articles of Association have been published.)

EAST LONDON LAND AND INVESTMENT COMPANY (Limited).—Capital 50,000*l.*, in shares of 1*l.* The usual business of a land and building company. The subscribers are—H. Petecker, Poplar, 5; W. Wood, Poplar, 5; C. G. Randall, Poplar, 5; R. W. Randall, Poplar, 5; S. Kimbel, Poplar, 5; F. J. Westbrook, Poplar, 1; P. Ambaines, Poplar, 5.

SACHS' ENGRAVING COMPANY (Limited).—Capital 100,000*l.*, in shares of 50*l.* To establish and carry on the business of engravers and printers in connection with acquired patents. The subscribers (who take one share each) are—J. J. Sachs, 8, Union-court; W. R. Haigh, Huddersfield; C. E. Freeman, Huddersfield; A. Farrer, Warley; H. G. Tetley, Bradford; C. T. Edmonson, Manchester; S. Wood, Dunton Basset; H. A. Weitaker, 80, Bishopsgate-street.

GROUND RENTS (Limited).—Capital 50,000*l.*, in shares of 100*l.* To purchase, let, sell, or otherwise deal with land, houses, buildings, &c., in England. The subscribers (who take 20 shares each) are—J. M. Stuart, Mansion House Chambers; H. T. Gardiner, 60, Queen Victoria-street; J. H. Donaldson, 11, Southwick-crescent; J. N. Mappin, Southgate; F. Debenham, 26, Upper Hamilton-terrace; V. J. Robinson, 31, Weymouth-street; S. Handford, East Dulwich; A. H. Donaldson, 11, Southwick-terrace.

THE GREAT FISHERIES COMPANY OF IRELAND (Limited).—Capital 250,000*l.*, in shares of 5*l.* The business of owners and hirers of smacks and trawlers, boats, and other fishing vessels; also of fish curers, salesmen, traders, and dealers, &c. The subscribers (who take one share each) are— S. Murray, 3, North-road; W. P. Hisketh, 32, Shepherd's Bush-road; W. F. Smith, Pimlico; J. R. Nunesins, 13, Wellington-street; H. Stoneman, Camberwell; R. A. Smith, 2, Grove-terrace; G. Melchior, 8, Gordon-street.

CHARBONNEL AND WALKER (Limited).—Capital 10,000*l.*, in shares of 5*l.* The business of a Parisian confectioner and French bonbon manufacturer in all branches. The subscribers are—A. J. Walker, Guernsey, 200; G. E. Arthur, Southampton, 200; E. Coles, Rotherhithe, 200; A. A. Walker, 173, New Bond-street, 200; W. H. Preedy, Kentish Town, 50; H. A. Turner, 65, Petterton-road, 20; E. Sulman, Hornsey Rise, 20.

JAMES OGDEN AND SONS (Limited).—Capital 5000*l.*, in shares of 5*l.* To acquire and continue an established business of spindle making and mill furnishing at Dukinfield, Cheshire. The subscribers are—J. Walker, Hurst Mill, 10; W. Kinsey, Ashton-under-Lyne, 10; L. Buckley, Stalybridge, 10; J. Cross, Ashton-under-Lyne, 50; J. H. Noble, Oldham, 10; A. S. H. Symons, Ashton-under-Lyne, 10; W. H. Charlesworth, Ashton-under-Lyne, 5.

THE HEILIGENBERG COAL AND BRICK COMPANY (Limited).—Capital 30,000*l.*, in shares of 1*l.* The general businesses of coal and ironmasters, brick and tile makers, potters, contractors for coal, coke, iron, drain pipes, bricks, tiles, and pottery in all branches. The subscribers (who take one share each) are—W. R. Revell, 3, Pall Mall-place; W. Bettechmin, 13, Charterhouse-street; R. Johnston, 9, New Broad-street; F. Orme, 9, St. Andrew's-street; E. B. Laycock, 52, Clapham-road: A. H. Miller, 10, Moorgate-street; E. J. Simons, 44, Charlwood-street.

THE BALIJAN TEA COMPANY (Limited).—Capital 35,000*l.*, in shares of 10*l.* To acquire, work, and develope a tea estate situated in the province of Assam, East Indies. The subscribers (who take one share each) are—E. T. Roberts, 34, George-street; R. Rowe, Dorking; W. S. Warren, Croydon; E. G. Rock, 1, Great Winchester-street; J. W Aubrey, Stamford-hill; F. S. Collis-Sandes, 10, Ashburn-place; J. Warren, Waltham Cross.

THE INTERNATIONAL EXPLOSIVES COMPANY (Limited)—Capital 65,000*l.*, in shares of 10*l.* The business of manufacturers of explosives, whether nitro-glycerine, dynamite, guncotton, torpedoes, &c., and to purchase, sell, and deal in same. The subscribers (who take one share each) are—G. R. T. Fraser, 2, Tokenhouse Buildings; J. S. Morrison, 2, Tokenhouse Buildings; H. S. Valentine, 9, New Broad-street; J, Croyle, 29, Threadneedle-street; T. W. Martin, 32, St. Swithin's-lane; J. Palmer, 29, St. George's-road; J. Walton, Bermondsey.

THE PARK-LANE TWIST COMPANY (Limited).—Capital 25,000*l.*, in shares of 10*l.* To acquire and work certain cotton mills situated at Preston, Lancashire. The subscribers (who take one share each) are—A. Simpson, Elmhurst; R. Smith, Longridge; J. McKean, Bondon; H. Spurrier, Manchester; J. Knowles, Ingleside; T. Crowdson, Handford; J. B. Harrison, Liverpool.

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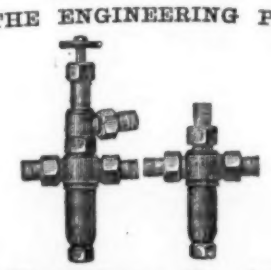

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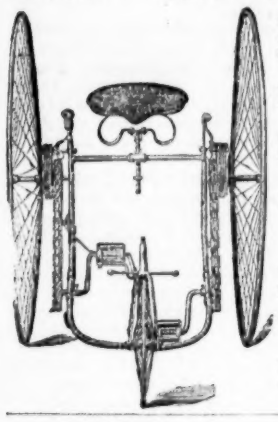

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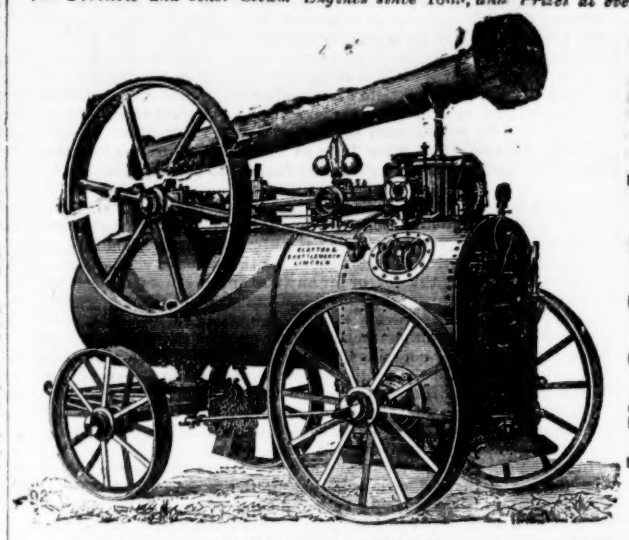

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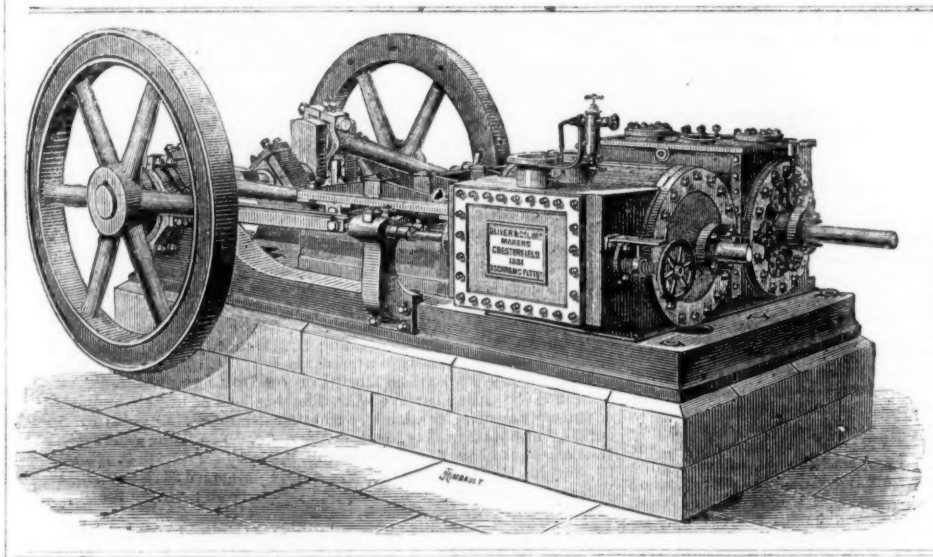

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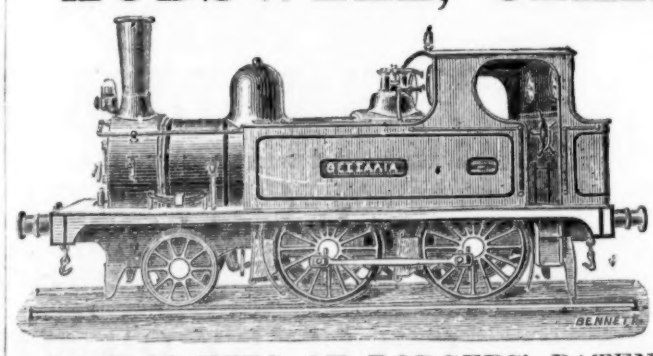

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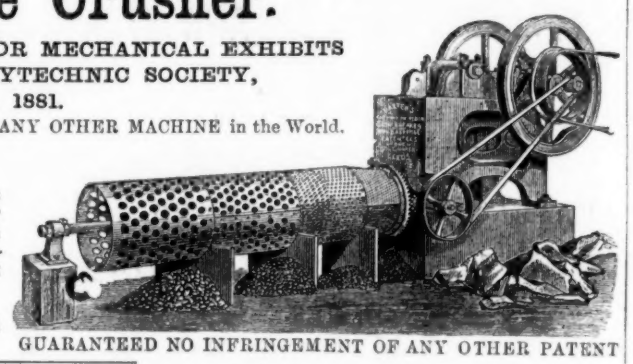

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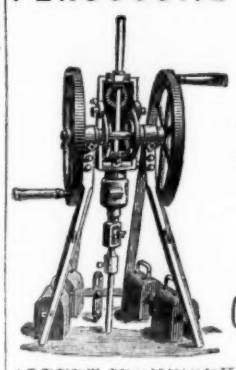

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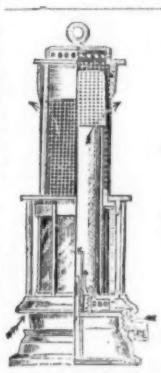

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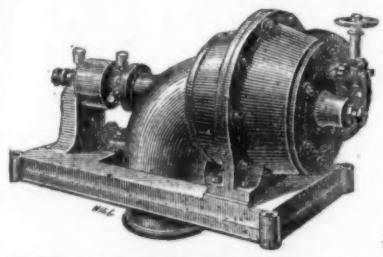

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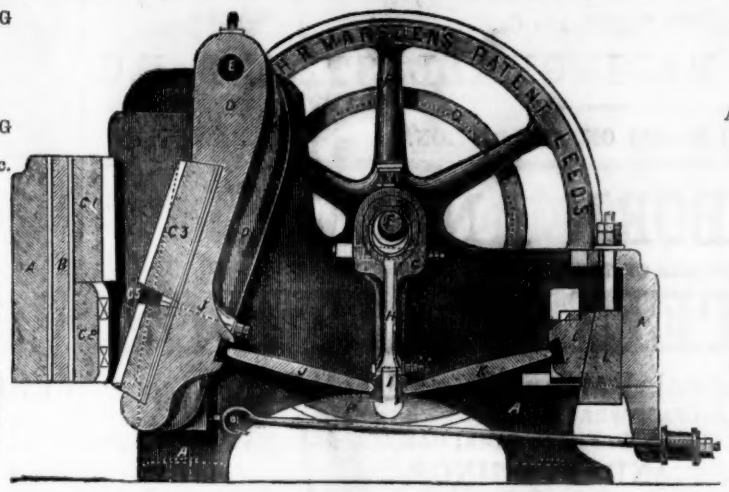

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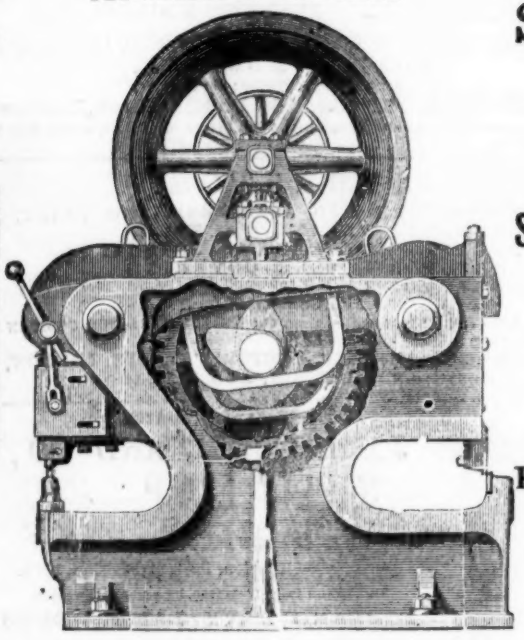

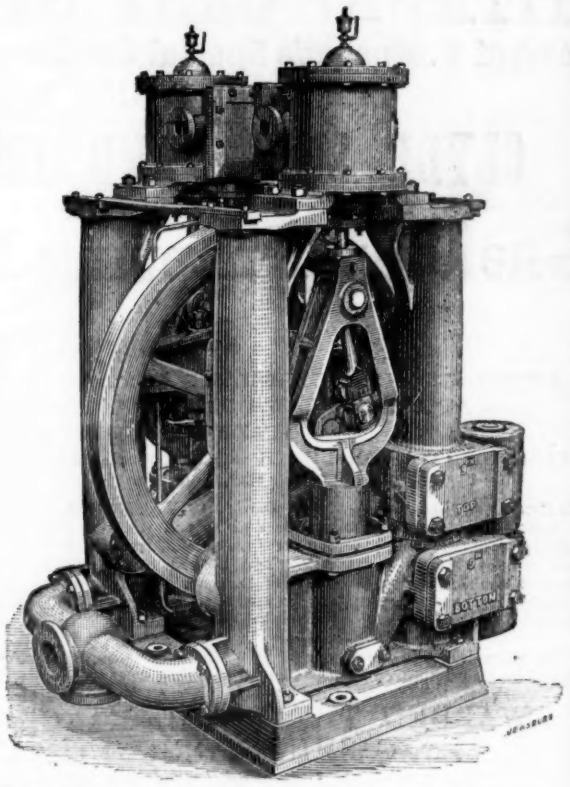

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